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ECONOMIC AND INDUSTRIAL AFFAIRS

No. 1944

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This serial report contains information on economic theory, organization, planning and management; major agreements on and development of trade within CEMA and outside the Bloc; articles on all aspects of the materials, services, machine, electronics, and precision equipment industries; and concepts and attainments in agriculture, forestry, and the food industry.

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YUGOSLAVIA, USSR SIGN PROTOCOL ON 1981-85 TRADE MEETING

Belgrade BORBA in Serbo-Croatian 27 Sep 79 p 6

[Excerpts] Yugoslavia and the Soviet Union are interested in further developing and deepening mutual economic cooperation. Both sides believe that it is useful to increase the volume of mutually beneficial economic cooperation in the 1981-1985 period up to the level of $20 billion to $21 billion.

This assessment was contained in the protocol of the meeting of the 17th inter-governmental Yugoslav-Soviet committee for economic and scientific-technical cooperation. The protocol was signed today by Gojko Ubiparip, vice president of the Federal Executive Council, and Ivan Arkhipov, vice president of the USSR Council of Ministers.

In assessing the significance of the meeting, Ubiparip stressed that it was held prior to the issuing of new development plans of Yugoslavia or of the Soviet Union for the next 5 years. This is significant, Ubiparip said, because this is also the period for bringing into agreement cooperation with the Soviet Union for the longer term.

"Our economic cooperation with the Soviet Union in the past 4-year period has been good. We hope that we will achieve the cooperation planned, in its entirety. Our economies are now much stronger and our countries, it could be said, much richer than 5 years ago; thus we believe it is possible to advance our bilateral economic cooperation."

Ubiparip said it is necessary to channel this cooperation not only toward developing the traditional market, but above all, toward higher forms of economic cooperation which have already successfully begun.

He said that our economic cooperation is developing in accord with the agreed-upon principles established in 1956 and continued at all meetings on the highest level. It is developing with complete bilateral understanding and acceptance of the agreed-upon principles on which both political and economic cooperation is now developing.

The meeting was held in a warm and cordial atmosphere, Arkhipov said immediately after signing of the protocol. "Both sides have made efforts so that the meeting's results would be fruitful, in order that the questions which we examined and the character of conclusions would reflect the good relations of the two countries.

"In regard to the questions we examined, we have attributed to them great significance. In essence, these questions were agreed upon at the May meeting on the highest level between our presidents, Comrades Tito and Brezhnev. This is, in fact, preparation of the proposal for concluding the long-term agreement on economic and scientific-technical cooperation between our countries up to 1985, or, in some fields even up to 1990.

"We established further the methods of work in this important document, so as to examine it again next year at the next meeting of the joint committee. At this time we examined also the questions of current economic cooperation. As always, we found mutually acceptable solutions. We made the unanimous judgment that the obligations of both sides are being successfully met and that the planned economic cooperation will be achieved."

It was declared at the joint committee meeting that in the first 8 months of this year contracts have been concluded between work organizations of the two countries for $1.6 billion worth of imports from the Soviet Union and $1.4 billion worth of exports from Yugoslavia. At the same time $800 million worth of exports [from Yugoslavia] and $900 million worth of imports [from the USSR] have already been achieved.

The committee declared that interested work organizations in the two countries have continued work on realizing the 1972 agreement on economic and technical cooperation in building and reconstructing industrial and other facilities in Yugoslavia. The agreement called for the delivery of $750 million worth of equipment, but up to now contracts for about $660 million worth have been concluded.

It was decided at the meeting of the committee to form a Yugoslav-Soviet branch group for cooperation in ferrous metallurgy, to examine ways and possibilities for furthering cooperation in this field.

CSO: 2800

BRIEFS

YUGOSLAV-CZECHOSLOVAK TRADE--The development of economic relations with Czechoslovakia has created the pre-conditions for meeting the targets of the 1976-80 agreement ahead of time, it was said at the recent meeting of the section on economic relations with the CSSR within the Yugoslav Economic Chamber. The 5-year trade agreement for the 1976-80 period called for a $4.2 billion volume of trade. Czechoslovakia is one of the CEMA countries with which Yugoslavia has the most contracts on cooperation and specialization. A total of 23 contracts on [enterprise] cooperation have been registered up to now (including 7 in tools and machine tools, 3 in low-voltage current, 4 in household appliance production, 2 in construction machinery). Three of these contracts have already been fully carried out. Last year about $35 million was earned by both countries on the basis of cooperation. Earnings from Czechoslovak tourists visiting Yugoslavia has ranged between $15 million and $17 million annually, and the amount for this year is expected to be over $20 million. In the last 3 years the value of foreign trade with Czechoslovakia has amounted to $2.3 billion worth of goods and services; this year's volume is expected to be $1 billion, an achievement not expected until next year, according to the current 5-year agreement. The 1978 trade volume represents an increase of about 14.9 percent over 1978. [Excerpt] [Belgrade PRIVREDNI PREGLED in Serbo-Croatian 2 Oct 79 p 12]

VISITING LATVIAN MINISTER--On 3 September Milan Grande, leading secretary of the Czech Central Committee of the Czechoslovak-Soviet Friendship Association, received in Prague a delegation of Soviet agricultural specialists led by Kazimir Anspok, minister of agriculture of the Latvian SSR, which is visiting the All-State Agricultural Exhibition in Ceske Budejovice. [Bratislava PRAVDA in Slovak 4 Sep 79 p 2 AU]

CEMA'S FADEYEV ARRIVAL--CEMA Secretary N. Fadeyev arrived in Prague on 13 September. At the Ruzyne airport he was welcomed by R. Rohlicek, deputy premier and permanent CSSR representative to CEMA. [Bratislava PRAVDA in Slovak 14 Sep 79 p 2 AU]

TRADE MINISTER'S RETURN--Czech Trade Minister A. Jakubik has returned home from East Berlin where he attended, at the head of the CSSR delegation, the 11th meeting of the CEMA states' domestic trade ministers. [Prague PRACE in Czech 15 Sep 79 p 5 AU]

GDR BRNO FAIR VISITORS--GDR Foreign Trade Minister Horst Soelle, accompanied by GDR ambassador to the CSSR Gerd Koenig, paid a visit to the Brno international engineering fair on 14 September. [Prague RUDE PRAVO in Czech 15 Sep 79 p 2 AU]. Gerhard Weiss, deputy chairman of the GDR Council of Ministers, and Rudi Georgi, GDR minister of maching tool and processing machinery building, visited the Brno international engineering fair on 15 September. [Prague RUDE PRAVO in Czech 17 Sep 79 p 2 AU]

CSO: 2400

WEST GERMAN COMMENTATOR PESSIMISTIC ABOUT CSSR EXPERIMENT

Bonn DIE WELT in German 19 Sep 79 p 17

[Article by Gerd Brueggemann: "The CSSR and Economic Performance"]

[Text] The Czechoslovak economy presents a rather somber picture at the end of this summer, but this did not keep top officials of the government planning commission in Prague from dishing out optimism in a conference with Western journalists recently. They pointed out that as in earlier years all important objectives of the Sixth Five-Year Plan (1976-1891) had also been reached in the first half of 1979. Thus the national product had increased 4 percent, machinebuilding industry production 6 percent, and the manufacture of consumer goods 4 percent. Foreign trade had also developed according to plan, while people's income rose not quite 3 percent.

The planning experts did concede, however, that in order to make up production losses caused by the winter there had been intermittent lagging behind the plan during the first half-year. Energy supply had not been what it should be, but industrial needs could be adequately covered in the future by supplies from socialist countries, particularly the Soviet Union.

Foreign experts on the CSSR economy, however, are not really ready to believe such self-portrayals. They think the energy problem is far more serious than described here. Apparently the political officials in Prague had believed far too long in the Soviet Union's ability to deliver, and now it probably had turned out that Moscow, if at all, was ready to supply additional oil only at world market prices or not much below them. It certainly was no exaggeration to say that the CSSR was on the brink of a crisis.

The fact that this description of the conditions is closer to reality than the statements of the planning commission also becomes clear from a speech delivered by Premier Strougal to miners in early September. In it the head of government in Prague dealt in a very detailed manner with energy questions, indicating that the CSSR, though in possession of sizable brown coal deposits, henceforth would have to come up with substantially higher amounts for importing oil than had been anticipated.

Strougal, who in Prague has acquired a reputation of a rational economist, in that speech also dealt with other problems of socialist planning which are particularly striking in the CSSR. He said: "To raise performance, quality and productivity is unthinkable without changing the way, style and methods of management and planning."

Actually even in the Eastern bloc there is hardly any economy which has gone as far as the CSSR in leveling things off. Almost detached from the performance of the individual, even top incomes are only about twice as high as the average income of all those employed in industry--2,600 korunas, or barely more than 500 deutsche marks according to the official rate of exchange. No wonder then that readiness to perform lags far behind the ability to perform.

Strougal therefore pointed out that to offer plants and workers greater material incentives deriving from the results of their activities is not what counts in such a situation. It is, however, already open to question as to whether the Strougal experiment (the term "reform" has been in ill repute since 1968) would change the economic reality in the way desired--provided that it is in fact carried out. For it appears that the proposals are still the subject of dispute in the country's political leadership circles.

According to available information, it is to be expected that a substantial part of additional remuneration related to performance is to go not to the employees but into collective enterprise funds.

This closes a vicious circle. In order to raise exports yielding foreign currency, the products would have to be in demand on Western markets. This would presuppose greater readiness for performance, greater innovative ability and a change in quality standards. This, however, is not rewarded by static-socialist planning concepts, oriented to a large extent in accordance with the requirements of Soviet economic imperialism.

In fact the sole means which also in the CSSR has always made it possible time and again to carry on in this kind of situation comes not from the socialist planning arsenal but from the Austro-Hungarian past: muddling through.

8790
CSO: 3101

PROBLEMS WITH PRODUCTION OF COMPUTERS NOTED

Prague VECERNI PRAHA in Czech 24 Sep 79 pp 1, 3 AU

["VS"-signed interview with Z. Jehlicka, director of the Zpa Cakovice National Enterprise: "Is the EC 1025-Computer Asleep?; This Year's Production Threatened; Replacement of Storage Elements Imported From Capitalist States; Will All the Problems Be Resolved?"; place and date of interview not specified]

[Text] For almost 2 years you could follow, in the pages of VECERNI PRAHA, the development and the preparation of production of the first Czechoslovak computer of the 3.5-generation--EC 1025, which was introduced into the program of the standardized system of CEMA electronic computers. Last year, when the first prototype was born, we wrote about the EC 1025.

What progress has been made since then? According to plan, normal production should begin this year. We asked a representative of the producer of the final product--Zdenek Jehlicka, director of the Zpa Cakovice National Enterprise--whether it has actually started.

Answer: At the end of the last year the first two prototypes saw the light of day. This July we displayed one of them successfully at a Moscow exhibition that was devoted to the 30th CEMA anniversary and to the 10th anniversary of the standardized system of electronic computers; it was also shown at this year's Brno Fair. This year we want to produce another two computers in a test series within the framework of the normal production plan. However, the situation does not seem to be favorable.

Question: What are the causes?

Answer: The deliveries of hybrid circuits from the Tesla Lanskroun enterprise are lacking. We also urgently need large-capacity disks [velkokapacitni disky] from Bulgaria--but for the time being we have not been able to import them owing to problems, the solution of which is not within the authority of our enterprise. We assume, however,

that we will overcome the difficulties and that we will be able to fulfill our commitments, in cooperation with the Research Institute for Electronic Computing Appliances and with other subcontractors from the Zavt and Tesla economic production units. Should we fail, it would mean a shortfall of Kcs32 million in the plan.

Question: Those difficulties could also threaten the computer's production in the years to come. Are you seeking a substitute solution?

Answer: To prevent further difficulties, two enterprises of our economic production unit--the Zpa Novy Bor enterprise and the Zvt Banska Bystrica enterprise--will start producing multistrata printed connections [vicevrstve plosne spoje] and Banska Bystrica, in addition, even the much needed hybrid circuits. The Research Institute for Electronic Computing Appliances envisages, from next year onward, a further improvement of the blueprint stage of the computer: all storage elements, which we are importing from capitalist states, should be replaced by similar elements from the USSR. That will result in savings of Kcs315,000 per installation. All charges included, the functioning of the whole computer will improve, at the same time, by an increase of its internal memory and an acceleration of its operations. In the next five-year plan the EC 1025 installations should become the pivotal program of our enterprise as far as computer technology is concerned. By 1985 we would like to produce at least 250 computers of the EC 1025 type.

CSO: 2400

IMPROVEMENT IN COAL BRIQUETTING TECHNOLOGY AIDING ENERGY SUPPLY

Freiberg NEUE BERGBAUTECHNIK in German Vol 9 No 8, Aug 79 pp 432-443

[Article by Prof Dr Herbert Krug and Dr Wolfgang Naundorf, Freiberg Mining Academy, Industrial Engineering and Silicate Technology Department:
"Significance and Future Role of Brown Coal Briquetting in the GDR"]

[Text] 1. Objective of Brown Coal Briquetting

Each year, about 250 million t of earthy brown coal are being mined in the GDR with water contents between 50 and 60 percent and lower caloric values of about 8,000-11,000 kJ/kg. The most important field of utilization of raw coal in the mined state is electric energy generation in public thermal power plants as well as electric energy and steam generation in industrial and heating power plants. In spite of the increased specific system costs, which arise particularly from the high degree of water evaporation and the low caloric value, relatively cheap electric current can be generated from this coal because of its comparatively low thermal price. On the other hand, low-calorie and noncaking earthy soft brown coal cannot be used by many other consumers in the mined state or they can be used only to a limited extent. These utilization areas can be opened up for tertiary soft brown coal only through prior briquetting. For this reason alone, about 100 million t of raw brown coal are being processed in the GDR into about 50 million t of brown coal briquettes without the process-dependent firing coal requirement. Briquetting thus is an absolutely necessary refining stage for this type of coal; it leads to an increase in the following properties:

(a) As a result of briquetting, the mostly fine-grained brown coal is turned into a solid and identically shaped fuel with the particular desired format. This essential improvement in the form value of brown coal among things results in the following advantages:

It turns out to be very suitable for grate furnaces,

The identically shaped briquette format and the high fire resistance of the briquettes considerably improve the conditions for controlled as well as complete and thorough combustion,

The briquettes are easily stacked,

The briquettes have a high degree of mechanical strength and a great degree of water resistance (except for the salt coals); both quality characteristics guarantee a high degree of shape preservation of the briquettes during transportation and storage.

(b) Due to the drying of the moisture content from about 50-60 percent down to 10-20 percent, the caloric value of the coal is increased from about 8,000-11,000 kJ/kg to about 17,000-22,000 kJ/kg, in other words, more than double the original amount:

$$h_{uB} = \frac{100 - w_B}{100 - w_K} (h_{uK} + 24.51\, w_K) - 24.51\, w_B \quad \text{(in kJ/kg)}. \tag{1}$$

where:

h_{uB} is the lower caloric value of the briquettes (in kJ/kg),

h_{uK} is the lower caloric value of raw brown coal (in kJ/kg),

w_K is the water content of raw brown coal (in percent),

w_B is the water content of the briquettes (in percent).

This heating value increase among others introduces the following advantages:

Reduction in the specific expenditure for fuel transportation and storage;

The reduction of the water content makes it possible to achieve considerably higher combustion temperatures, in the combustion of briquettes, than is possible with raw brown coal; the briquettes are also suitable for burning processes for which raw brown coal cannot be used;

And the combustion of brown coal briquettes makes it possible to achieve considerably higher specific furnace loads.

(c) As a result of briquetting, the refining properties of noncaking earthy soft brown coal are considerably improved or perhaps initiated to begin with. From highly volatile and noncaking soft brown coal one can, for example, produce lump coke according to the single-stage coking method only if the coal has first been pressed into special briquettes with a high lump coke formation capacity. The production of high-grade pyrolysis briquettes thus is the primarily decisive process stage for the production of lumpy medium-temperature or high-temperature coke from brown coal. For soft brown coal, which can be obtained cheaply, it is possible in this

respect undoubtedly to open up even larger reserves and greater effects as compared to the state of the art employed so far (1).

In brown coal briquetting, the raw coal, coming from the pit, with a grain size of about 600/0 mm and a water content of 50-60 percent, is first of all brought to a fineness of about 6.3/0 mm by means of comminution and screening in the raw coal processing division. This is followed by the following process phases: drying, dry-coal treatment, pressing, as well as briquette cooling and loading (Figure 1). Here, the raw brown coal, with 50-60 percent moisture, is dried to a dry-coal water content of 10-20 percent along with the pressing of the highest effort in terms of equipment and above all energy. For coal drying, the GDR, with the exception of a few fire gas drum driers, uses almost exclusively contact driers (especially rotary driers) heated with low-pressure steam from counterpressure turbines or, in some cases, also steam engines. Because of this favorable force-heat combination, the great heat requirement for drying the brown coal--which totals about 3,000 kJ per kg of evaporated water--can for the most part be supplied through waste heat which is uselessly evacuated into the atmosphere via the cooling towers in the condensation power plant. Recently, earlier efforts to use the heat content of the drier vapors were revived successfully. Hot water supply for huge hot-house complexes is particularly suitable here.

In spite of this exemplary utilization of heat energy and also considering the fact that all subsystems in the various plant divisions in the brown coal briquette factories are distinguished by high output rates as well as relatively low repair and maintenance expenditures, brown coal briquetting remains a refining method with a considerable effort in terms of the national economy which nature did not relieve us of. Nevertheless, the various grades of brown coal briquettes in the GDR will assert themselves also in long-range terms for many areas of heat supply utilization, even against such natural, highly refined fossil energy sources as hard coal, petroleum, and natural gas, as a fuel that is advantageous from the viewpoint of the national economy as a whole so long as soft brown coal remains obtainable in adequate quantities and relatively cheaply especially in view of the fact that:

Briquetting partly brings about a considerable improvement in the utility properties of soft brown coal,

The specific refining costs per tons of briquettes remain relatively low because of the high performance capacity of the plants,

The force-heat combination pushes the energy conversion degree for briquetting above 90 percent and

Brown coal briquettes have good burning properties and, if the burning process is properly managed, cause relatively little environmental pollution.

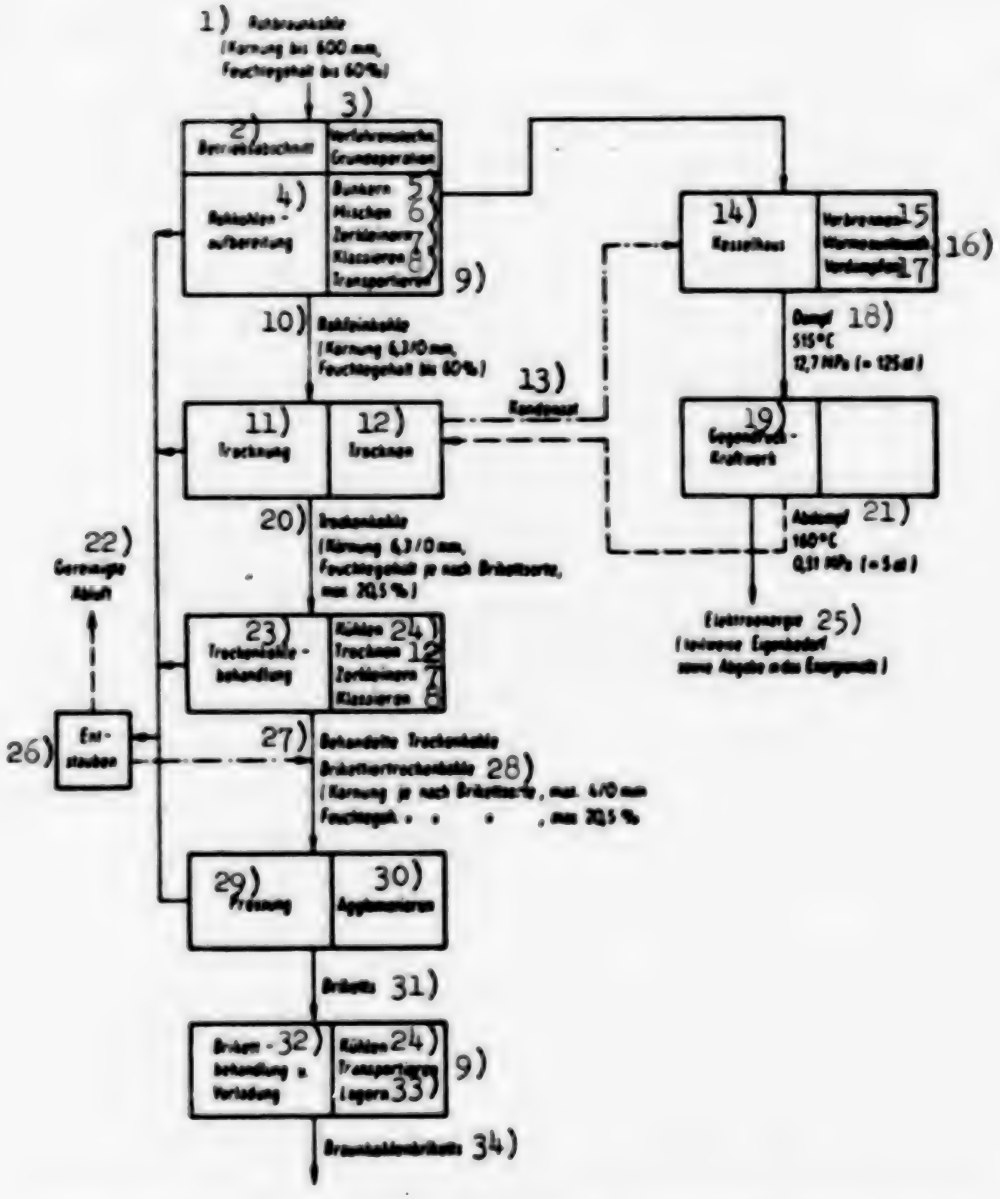

Figure 1. Brown coal briquette factory diagram (including power plant). Key: 1--Raw brown coal (grain size up to 600 mm, moisture content up to 60 percent); 2--Plant division; 3--Basic process engineering operation; 4--Raw coal preparation; 5--Bunkering; 6--Mixing; 7--Comminuting; 8--Classification; 9--Transportation; 10--Raw fine coal (grain size 6.3/0 mm, moisture content up to 60 percent); 11--Drying; 12--Drying; 13--Condensate; 14--Boiler house; 15--Burning; 16--Heat exchange; 17--Evaporation; 18--Steam; 19--Counterpressure power plant; 20--Dry coal (grain size 6.3/0 mm, moisture content depending on briquette grade, maximum 20.5 percent); 21--Waste steam; 22--Purified exhaust air; 23--Dry coal treatment; 24--Cooling; 25--Electric energy (partly for in-house needs as well as delivery into the energy grid); 26--Dust removal; 27--Treated dry coal; 28--Briquetting dry coal (grain size depending upon briquette grade, maximum 4/0 mm, moisture content depending upon briquette grade, maximum 20.5 percent); 29--Pressing; 30--Agglomerating; 31--Briquettes; 32--Briquette treatment and loading; 33--Storage; 34--Brown coal briquettes; at--atm abs.

Of course, in determining future briquette output, one must not fail to take into account the fact that the availability of higher-grade energy sources from the world market is subjected to certain fluctuations and that the import burden on the national economy for energy sources must be kept within limits. Besides, in longer-range terms, the production of special briquettes for fixed [packet] bed pressure gasification and especially for medium-temperature and high-temperature degassing would seem to remain necessary and also advantageous, if the latest state of the art is used. At this time, about 5 million t of briquettes are being refined in the GDR for high-temperature coking alone according to the Bilkenroth and Rammler method (1-7), with an energy conversion degree of about 75 percent; they are being turned into lump coke, city gas, and valuable liquid products.

2. Production of Brown Coal Briquettes for Heating Purposes

The more than 120-year history of binderless briquetting of soft brown coal always emphasized the production of high-grade and low-price briquettes for heating purposes down to the very present. Due to very intensive and fruitful research and development work, it became possible in the past to build highly efficient individual systems and installations. This successful development work is being continued by VEB Zemag Zeitz in close teamwork with research groups at the Freiberg Mining Academy and industry institues as well as the combines. Striking examples of the high efficiency of enterprise equipment are represented, for example, by the development and construction of the 4,000-m^2 or 4,400-m^2 rotary drier with a casing diameter of 5.3 m and a length of 8 m as well as double-twin mold-channel presses with maximum permissible pressing forces of 3 or 4 mn, the introduction of terminating cooling chain conveyors for dry coal cooling, the construction of new hammer mills as well as efficient resonance or vibrator screens for raw coal preparation and the implementation of many solution proposals for the optimization and automation of production facilities.

The share of brown coal briquette production for heating purposes in the GDR is about two-thirds of the total annual output of just about 50 million t. For this utilization purpose, dry brown coal is briquetted for the most part with the following parameters and without any binding agents on mold-channel stamp presses:

Grain size of dry coal	Δd = 4/0 mm,
Water content of dry coal	w = 18 to 21 percent,
Pressing temperature	θp = 45 to 50°C,
Pressing pressure	p = 80 to 120 MPa.

With these briquetting parameters, it was possible in the past in the GDR to produce, from soft brown coal, guaranteed high-quality briquettes whose pressure resistance varied mostly between 8 and 12 MPa as a function of the briquetting capacity of the individual coal grades from the various coal regions. The specific briquette output came to about 30-35 kg of briquettes

per square centimeter of press surface and per hour. The increasing supply of briquette factories with coals whose briquettability partly varied considerably and which came from various strip mines as well as the deteriorating briquetting capacity of run-of-mine coal, which in general reveals a deteriorating basic trend for the future, however will make it possible to maintain or increase this qualitative and quantitative performance level in the future only if several important factors can be properly adapted. Such performance-increasing measures however will lead to the best possible result only if the subsequently briefly sketched features of binderless brown coal briquetting are considered.

The strength of brown coal briquettes is determined by the number and intensity of the binding mechanisms activated in the entire coal substance of the blank. According to the current state of the art (8, 9, 10), we can start here with the idea that, in brown coal briquetting, we essentially use only secondary valence bonds for the consolidation of dry coal into briquetting substance, whereby, in addition to the van-der-Waals bonds, the blank's strength is decisively determined above all by the hydrogen bridge bonds. It is therefore a basic requirement for the attainment of a maximum solidified briquette bond that the dry brown coal is condensed not only along the grain surfaces but into the macromolecular area in a homogeneous manner and with maximum intensity as well as with a compression increase that will be simultaneous throughout so that, on the one hand, if possible all usable bonding potentials can be activated in every volume element of the developing brown coal briquette, including the surrounding force fields, within the coal macromolecules, with high intensity for the formation of a stable blank, and that, on the other hand, a weakening of the briquette bond due to nonhomgeneity points, in the form of incompletely condensed volume elements and/or local brittle fractures in excessively pressed portions, will be avoided. Under that condition, it is possible to produce very strong blanks from soft brown coal because this type of coal has an extraordinarily large number of secondary valence forces which in particular start from the many polarized groups of macromolecules into which the more strongly electron-negative atoms O, N and S are built. Besides it must be kept in mind that especially the bonding energy of the hydrogen bridges can attain values of more than 40 $J \cdot mol^{-1}$. The briquetting parameters therefore must be so adjusted for pressing the dry brown coal that as many potential fields as possible will be directly interconnected and that they can be further boosted by water molecules (Figure 2). Besides, the force fields, which cannot be directly tied in for stereometric reasons, should at least be brought about in the best possible fashion by means of intermediate water molecules.

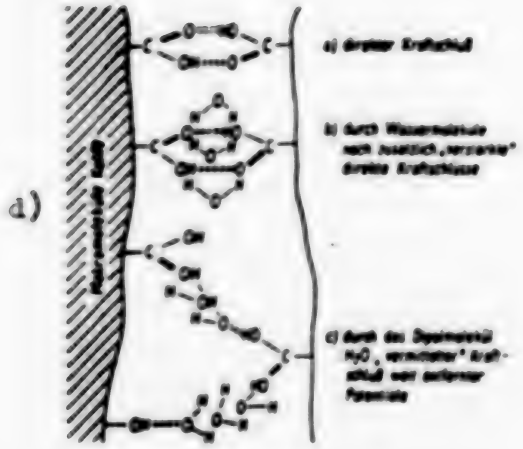

Figure 2. Hypothetical concepts on how the hydrogen bridge bonds work. Key: (a) Direct force-lock; (b) Direct force-locks additionally "reinforced" by water molecules; (c) Force-lock of remote potentials "brought about" by the dipole molecule H_2O; (d) Coal macromolecules.

For the optimum adjustment of the pressing process according to the above objective, a comprehensive state of the art was developed in the past concerning the influence of the raw material, process engineering, and equipment factors regarding briquette quality and the specific briquette output of the presses. The most important results of long-term research efforts were summarized in FREIBERGER FORSCHUNGSHEFT A 574 (11). Accordingly, in briquetting one must constantly keep in mind that the composition of soft brown coal, which is very heterogeneous anyway, is subjected to major fluctuations even if the briquette factory gets its coal from just one strip mine. This makes the optimum adjustment of the briquetting process considerably more difficult because the briquetting properties of the various petrographic components of coal partly differ quite fundamentally. It is furthermore characteristic of binderless brown coal briquetting that the large number of raw material, process-engineering, and equipment factors have a complex effect during the pressing process and influence each other very heavily in terms of their nominal effect on briquette quality. Figures 3 and 4, for example, show the close reciprocal interaction between pressing pressure and dry coal moisture content or between pressing temperature and dry coal moisture content in terms of the influence on briquette pressure resistance. These characteristic line fields thus prove that, in brown coal briquetting, there are no magnitudes which generally have great or little influence on the target magnitude of briquette pressure resistance; the effect of a briquetting parameter instead depends on the values at which the other process variables are adjusted. We thus have no generally valid optimum parameters but only optimum value combinations for all influencing

magnitudes which are shifted as a whole during any change in any individual magnitude (11).

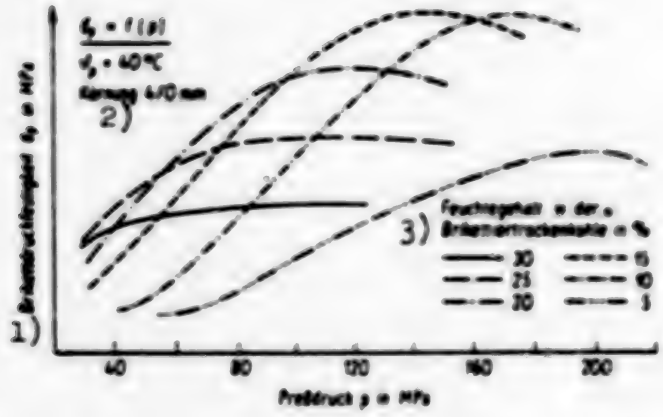

Figure 3. Briquette pressure resistance as a function of pressing pressure and moisture content of briquetting dry coal.
Key: 1--Briquetting resistance; 2--Grain size; 3--Moisture content w of dry briquetting coal in percent; 4--Pressing pressure p in MPa.

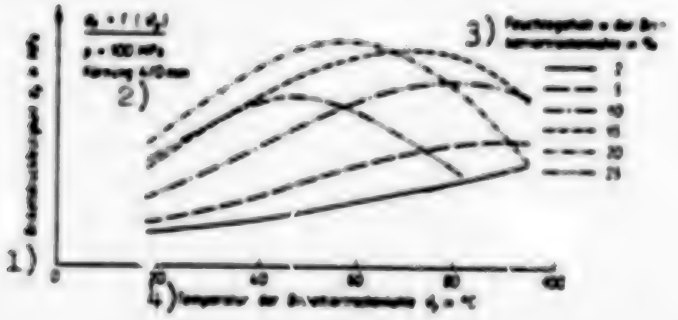

Figure 4. Briquetting pressure resistance as a function of the pressing temperature and the moisture content of dry briquetting coal.
Key: 1--Briquette pressure resistance; 2--Grain size; 3--Moisture content w of dry briquetting coal in percent; 4--Temperature of dry briquetting coal θ_p in °C.

When it comes to running the mold channel press under practical operating conditions there is one factor that makes things more difficult and that is that, in this type of press, the pressing pressure cannot be directly adjusted as the primarily decisive influencing magnitude for the complete and intensive release of the bonding forces; instead, it is kept on the required level of about 80-120 MPa only indirectly via all those briquetting parameters which determine the friction and molding

resistance of the briquette plug taking shape in the molding channel. Thus, the briquetting parameters, especially raw material and process engineering parameters, which exert direct influence on briquette strength, additionally have an effect on briquette formation through the "control" of the pressing pressure, whereby conflicts are entirely possible between primary and secondary effects. This superposition of differing functions of course makes it more difficult to control the briquetting process and in the past in some cases also led to misinterpretations. The effects of this twin function of the influencing magnitudes are illustrated for example by Figure 5 and 6 for the dependence of briquette pressure resistance on the grain size distribution of dry coal in the form that, in the mold-channel press, for the relationship $\sigma_p = f(m)$ a maximum curve with a compact shape does not develop, as in the case of the laboratory experiments on the hydraulically operated press; instead, the briquette resistance declines abruptly as the grain size distribution index m becomes greater in a relatively broad range of variations. The grain size distribution index m here is the exponent of the Gates-Gaudin-Schuhmann distribution:

$$D = 100\left(\frac{d}{d_{max}}\right)^m \quad \text{(in percent)} \qquad (2)$$

The presumed discrepancy between the curve trends of both press types materializes here only because, in the mold-channel press, the briquette pressure resistance is influenced more by the pressing pressure that drops as m grows bigger (Figure 6) than by the more favorable grain size distribution. The maximum trend for the relationship $\sigma_p = f(m)$ therefore materializes in the mold-channel press only if the superposed influence of the pressing pressure is compensated by the formation of the quotient σ_p/p. But there are also several briquetting factors whose direct and indirect influence on the briquette pressure resistance works in the same direction (11). Thus, for example, a rougher dry coal grain pattern during briquetting on mold-channel presses causes a by far greater drop in the briquette pressure resistance than would be expected according to laboratory briquetting because, as the grain size range increases, the pressing pressure also drops if no specific countermeasures are taken.

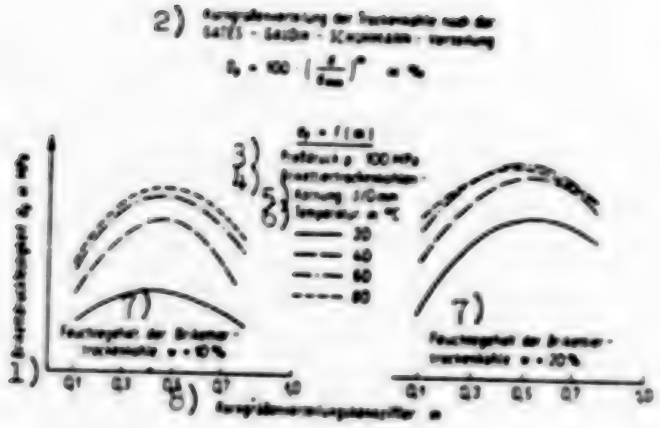

Figure 5. Briquette pressure resistance as a function of grain size distribution of dry briquetting coal.
Key: 1--Briquette pressure resistance; 2--Grain size distribution of dry coal according to Gates-Gaudin-Schuhmann distribution; 3--Pressing pressure; 4--Dry briquetting coal; 5--Grain size; 6--Temperature; 7--Moisture content of dry briquetting coal; 8--Corn-size distribution index m.

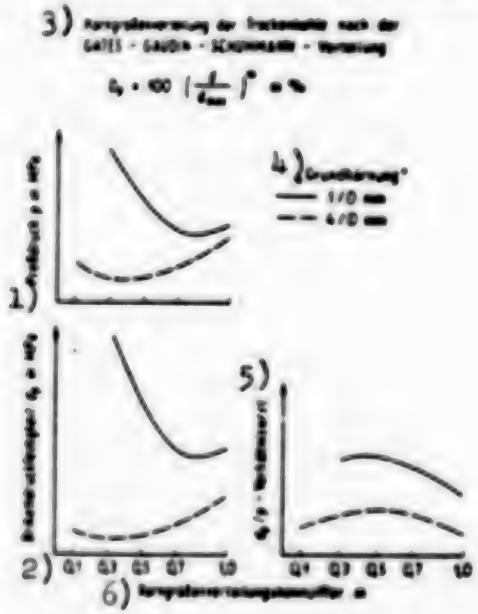

Figure 6. Pressing pressure, briquette pressure resistance, and σ_p/p ratio as a function of the grain size distribution in dry briquetting coal.
Key: 1--Pressing pressure; 2--Briquette pressure resistance; 3--Grain size distribution in dry coal according to Gates-Gaudin-Schuhmann distribution; 4--Basic grain size; 5--Ratio; 6--Grain size distribution index m.

The above remarks on some special aspects of brown coal briquetting show that, especially in this coal refining method, optimum production results can be achieved only if the theoretical foundations of binderless brown coal briquetting are precisely known, including all those factors which make it more difficult to run the pressing process. Realizing this situation, the optimum way to run briquette production by no means turns out to be as difficult as some complex reciprocal relations might possible cause us to fear. An essential simplification for the best possible adjustment of the pressing process for example arises already from the fact that the influence of all briquetting parameters on briquette strength--such as it was determined in comprehensive laboratory experiments--can be transferred, in terms of its qualitative basic trend, without reservations, to the large-scale industrial production conditions (11). If, for example, in laboratory experiments involving dry brown coal to be pressed, the grain size distribution index was optimally determined at $m = 0.5\text{-}10$, the pressing pressure at $p = 120$ MPa, the moisture content at $w = 19$ percent, and the pressing temperature at ϑ_p at 55°C, then these parameters also apply to the mold-channel press. In the last-mentioned case one must merely consider the fact that, in this instance, the dry coal must be cooled to about 45°C because the briquettes, in contrast to laboratory briquetting, are heated by an average of 10 K due to wall friction in the mold channel. The undoubtedly most difficult problem here at this time involves the adjustment and maintenance of the desired pressing pressure with simultaneous elimination of quality-reducing factors which can arise from reciprocal relationships between p and the other briquetting factors. This is primarily due to the fact that the actually developing pressing pressure, for measurement reasons, is measured in the production enterprises only in special cases and thus is nominally not known at all. In many production enterprises there are furthermore only limited possibilities for flexible pressing pressure control through instrument magnitudes which, in constrast to many other raw material and/or processing engineering briquetting parameters, do not exercise any indirect influence on briquette quality. In any future research and development work we must therefore concentrate on creating new prerequisites for the most continual possible pressing pressure measurement on every briquette line as well as for specifically target-oriented and as automatic as possible p-regulation through magnitudes that are adjusted in the instrument. The optimum determination of the mold-channel profile for the particular briquetting conditions should in the future likewise be the point of departure for the adjustment of the desired pressing pressure level. For the precision adjustment of the pressing pressure and above all for specifically target-oriented p-regulation, during the on-going briquetting process, one should in the future make increased use above all of the hydraulically adjustable press-on force against the pressure piece in the mold channel as well as mold-channel cooling. In the last-mentioned case this however presupposes new design solutions for mold-channel cooling similar to the proposal in (12) which permits considerably higher heat evacuation.

Considering the above-mentioned peculiarities of binderless brown coal briquetting using mold-channel presses, one can certainly open up considerable reserves for qualitative and quantitative performance increases in briquette

production by utilizing the state of the art attained (11). In conclusion we might mention some measures in this connection which in some cases can be implemented on short notice but which also represent long-range goals.

(a) The refining of dry coal constitutes an essential performance reserve (12). Just as about 20-30 years ago many briquette factories switched from the grain size 8/0 mm to 4/0 mm, one should in the future provide for the grain size of 2/0 mm, or in coals that make especially hard briquettes, even the grain size of 1/0 mm with the optimum grain size distribution in each case and with as little oversized grain (13) as possible for the production of briquettes for heating processes with w ≈ 19 percent.

Raw coal processing up to about 3/0 or 4/0 mm should contribute to the refining of the briquetting material. Assuming that we have efficient vapor dust removal systems, this would lead to a noticeable increase in the specific evaporation in many briquette factories. The remaining refinement of dry coal grain size down to 2/0 mm or 1/0 mm however should in each case be reserved for the dry coal treatment phase because a follow-up crushing intensifies the follow-up evaporation and cold cooling and the water content spreads are considerably reduced in this fashion.

Special attention should be paid in the drying and dry coal treatment operating phases to the best possible restriction of the water content spreads in the briquetting material.

(c) The redution of temperature spreads in the briquetting materials also contributes to the improvement of briquetting quality. One must therefore try to made sure that a temperature adjustment, possibly connected with the follow-up drying of freshly crushed oversized grains, will develop between the vapor utility dust and the cooled dry coal on longer conveyor runs.

(d) One main point in future research and development work should involve the creation of suitable instruments for the continuing measurement of the pressing pressure for each briquette line. Only if we know the actual p value can be adjust the optimum pressing pressure and only in this way can it be regulated during the production process. This would lead to a considerable time-wise homogenization of the briquette quality on all briquette lines. Besides, if we know the pressing pressure, we could also effectively change factors which increase the output.

(e) Better prerequisites for specifically target-oriented pressing pressure regulation (9) for example can be created through:

Controlled, hydraulically powered pressure plate stressing [loading],

Intensified and variable mold-channel cooling as well as

Specifically target-oriented and low-loss regulation of the press rpms and the briquette thickness.

(f) One basic requirement for the qualitative and quantitative performance increase in brown coal briquette production is the improvement of the entire measurement and regulating equipment for the most important process parameters in all plant divisions. Special attention must be devoted here to representative briquette quality control. This is particularly important because the performance capacity of the factory can be utilized to the maximum extent only if every briquette line and every part of the fuel lock bar attain the required quality level during maximum briquette production. The manufacture of brown coal briquettes with a high degree of uniform strength is a very important contribution to the effective utilization of brown coal because otherwise there will unavoidably be considerable energy losses which frequently cannot be evaluated or which can be evaluated only insufficiently. This includes especially losses due to the following:

Development of grinding during transportation and storage,

Increase in the share of unburned components in the combustion residues due to excessively rapid briquette collapse during burning,

Appearance of, for example, excessively high CO contents in the combustion gases during time intervals of excessively fast combustion speeds, for example, as consequence of excessively rapid briquette collapse and

Appearance of excessively high noticeable heat losses during time intervals of excessively fast briquette burning.

Furthermore, one should keep trying to develop aggregates which will be increasingly effective and efficient and which, to the extent possible, simultaneously perform several basic process engineering operations in a meaningful manner, which help reduce the coal losses, and which involve a lower specific energy requirement. This continuing modernization of plants is necessary because that is the only way one can raise the qualitative and quantitative efficiency of briquette factories and the specific refining costs to such a level that briquetting will in the future likewise hold its position in the field of efficient energy supply which is advantageous in many utilization areas.

3. Production of Pyrolysis Briquettes

Pyrolysis methods are mostly distinguished by relatively high energy conversion degrees which, for example, in the brown-coal high-temperature method according to Rammler and Bilkenroth (1), considering the force-heat connection, in spite of the increased expenditure for briquetting, amount to about 75 percent. Besides, many pyrolysis methods are characterized by a comparatively effective utilization of coal in terms of raw material management if the developing gas, all liquid products, and especially also the coal are produced with high utility properties. This is also why more than 10 million tons of special briquettes have been produced for brown coal degassing in the GDR without any change over many years, whereby

the decline in briquette production for low-temperature carbonization was extensively compensated by the performance increase in the brown-coal high-temperature coke producing plants. If the energy and raw material utilization of coal on the basis of improved methods, which at the same time would have to be environmentally safer, is to be accomplished even more effectively than has been the case so far, then coal pyrolysis will in the future likewise certainly hold on to its important position in the national economy. This will be the case above all if the strength of the coke compared to the level attained so far can be increased to such an extent that the ash-poor and sulfur-poor Niederlausitz brown coal will give us a genuine smelter coke for an at least percentage utilization in blast furnaces. Such an improvement of brown coal degassing at the same time would create justified prospects for the production of lumpy heating coke from West-Elbian low-temperature carbonization cokes. In this case one might even try to determine whether the scavenging gas furnaces in the low-temperature carbonization plants might possibly be replaced by the modified vertical chamber furnaces of the "Schwarze Pumpe" model because, in that case, it would be possible in addition to lumpy heating coke and tar also to produce rich gas [coal gas] on the basis of a high energy conversion degree of about 75 percent.

It is characteristic of noncaking and highly volatile soft brown coal that the high initial briquette strength and the high pyrolysis resistance of the briquettes constitute two basic, otherwise irreplaceable criteria for the generation of solid lump coke. Besides, it is necessary to make sure that the special briquettes are degassed very carefully according to a special heating schedule. Here, the production of special briquettes is the primarily decisive process stage for the generation of high-grade lump coke from brown coal through medium-temperature or high-temperature degassing because the briquette primarily predetermines the coke strength while the degassing conditions rather have the function of the "best possible utilization" of the lump coke formation capacity given to the briquette.

In making solid lump coke from earthy soft brown, the results so far were achieved by means of the BHT [brown-coal high-temperature] method according to Rammler and Bilkenroth (1). In this method, the necessary high degree of pyrolysis resistance in the coking briquettes was for the most part attained through the reduction of the dry coal moisture content from the otherwise customary 18-21 percent down to only 11 percent with simultaneous refinement of briquetting material grain size down to 1/0 mm. The necessary high pressure resistance of these special briquettes, amounting to at least 17 MPa, could be guaranteed--in spite of the known deterioration in the briquettability of brown coal as its optimum briquetting material moisture content keeps going down--through the high degree of finess of coal which is 1/0 mm, through the increased pressing temperatures of about 60-70°C, through the raising of the pressing pressure to figures of around 140 MPa, and through the selection of an ash-poor and sulfur-poor coal with a briquetting capacity that was high by nature. Other requirements--such as the selection of easily coked coal grades at the strip mine, the maintenance of low water content spreads in the briquetting material through separate follow-up drying of the coarse grain $\geq$ 3.15 mm, the specification of an

optimum grain size distribution for dry coal with a dust portion of ≤ 0.25 mm amounting to about 40 percent, the restriction of the oversized grain portion ≧ 1 mm to less than 12 percent, as well as the production of half-stone formats with a briquette thickness of around 35 mm--helped to contribute to assuring the high lump coke formation capacity of these special briquettes.

In spite of the significance and trend-setting success, high-temperature coke, made according to the BHT method, does have certain limitations with regard to lumpiness and resistance [strength]. According to the data in (1), we can expect the following grade breakdown for BHT coke under favorable production conditions:

≧ 45 mm	54%	} 76%
45/30 mm	22%	
30/20 mm	10%	
20/3 mm	7%	
3/0 mm	7%	

Accordingly, about one quarter of the total output comes in the form of fine coke. The micum abrasion strength M 40 of the coke fraction ≧ 45 mm is about 40 percent. With this kind of strength, BHT coke is not yet suitable for use in blast furnaces. The lumpy coke therefore is used primarily as high-grade heating coke and as reaction substance for carbide production. Although production enterprises certainly will still have reserves to be used in increasing the BHT coke pressure resistance and to improve the grade breakdown, we certainly cannot expect the kind of sudden quality improvement which, for example, would give us genuine smelter coke. Besides, a switch in the briquetting parameters for the production of low-temperature carbonization briquettes from the tar-rich West-Elbian brown coals to the parameters for the production of coking briquettes according to the BHT method does not offer any prospects for the production of a large share of satisfactorily solid lumpy low-temperature carbonization coke for heating purposes. That is not the case even if the dry brown coal is pressed in a steam atmosphere (14, 15, 16). In spite of the considerable increase in the briquette and coke strength--such as is shown, for example, in Figure 7 for the production of BHT coke from Niederlausitz coal under laboratory conditions--this quality improvement is by far not enough to produce smelter coke from Niederlausitz brown coal or lumpy low-temperature carbonization coke for heating purposes from low-temperature carbonization coal. This instead calls for the production of pyrolysis briquettes "of a new type" with a considerably higher lump coke formation capacity as compared to the level achieved so far. According to recent discoveries, there are entirely justified prospects for this, as we can see from the following brief presentation.

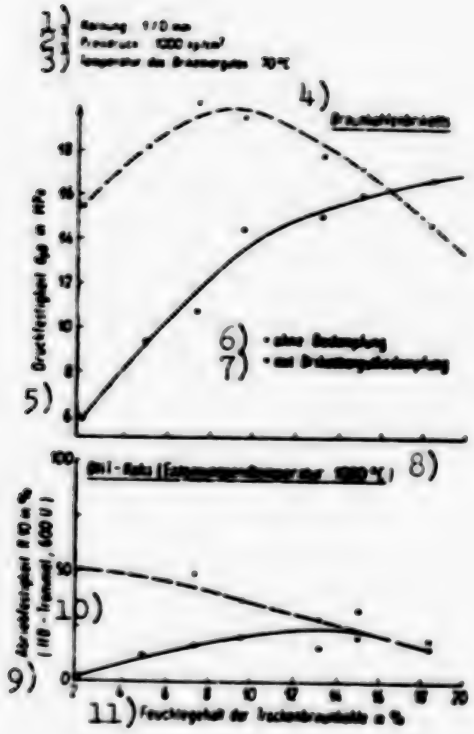

Figure 7. Briquette and coke strength as a function of the moisture content of dry brown coal with and without vaporization of briquetting material.
Key: 1--Grain size; 2--Pressing pressure; 3--Temperature of briquetting material; 4--Brown coal briquettes; 5--Pressure resistance; 6--Without vaporization; 7--With briquetting material vaporization; 8--BHT coke (final degassing temperature); 9--Abrasion strength; 10--Drum; 11--Moisture content of dry brown coal.

3.1. Hot Briquetting of Brown Coal

In the BHT method, the dry coal moisture content of about 11 percent is a compromise figure with which--in spite of the below-optimum briquetting water content, through increased expenditure before and after pressing--one can produce pyrolysis briquettes which at the same time are also distinguished by a high degree of initial strength and by a high pyrolysis stability. The lump coke formation capacity of the pyrolysis briquettes would undoubtedly go up if the moisture content of dry brown coal could be reduced without loss of briquette strength to values of close to 0 percent because, due to water drying, the blank bond is weakended both from the viewpoint of bonding theory (9, 17, 18) and due to water vapor tensions at the start of the degassing process. According to the entries in Figure 2, the production of solid briquettes with w = 0% is possible only if the loss of force-locks "strengthened" and "brought about" through water

molecules, in the almost water-free coal, can be compensated for or perhaps even exceeded through a corresponding increase in direct compact bonding potentials. Such an increase in the number of directly closed [compact] bonding potentials however presupposes that the plasticity of water-free coal has improved so greatly, as compared to the pressing conditions below 100°C, that a through-going homogeneous densification of the briquetting material would enable us to overcome all stereometric barriers for the maximum triggering of direct force-locks. Hot-briquetting of brown coal, at pressing temperatures of around 250°C, offers realistic prospects for this. On top of that we have the fact that the weakening of the briquette bond, at the start of the pyrolysis process, should also be capable of being reduced by the partial predegassing of the coal prior to briquetting.

In recent years, it has been confirmed repeatedly through investigations (17, 18, 19, 20), that the lump coke formation capacity of brown coal briquettes is clearly increased due to the hot-briquetting of dry coal with w = 0% and pressing temperatures of around 250°C.

Table 1. Pressure Resistance of Coke from Various Soft Brown Coals with and Without Use of Hot Briquetting

	e) Teergehalt (in %) (wf)	f) Koksdruckfestigkeit σ_{pK} (in MPa) w = 10%, ϑ_p = 75°C mit Bedampfung g)	h) Heißbrikettierung w = 0%, ϑ_p = 250°C	i) Differenz Spalte 3 – Spalte 2
	1	2	3	4
1. Schwelkoks a) (Entgasungsendtemperatur 600°C) b)				
Lauchhammer	7.1	8.4	12.5	+ 4.0
Espenhain	14.8	3.6	9.7	+ 6.1
Amsdorf	21.4	2.9	7.7	+ 4.8
Amsdorf, extrahiert c)	16.5	7.4	20.7	+ 13.3
Merseburg Ost	14.1	10.7	18.6	+ 7.9
2. BHT-Koks d) (Entgasungsendtemperatur 1000°C) b)				
Lauchhammer	7.1	13.3	26.8	+ 13.5
Espenhain	14.8	4.3	13.0	+ 8.7
Amsdorf	21.4	4.0	13.8	+ 9.8
Amsdorf, extrahiert c)	16.5	11.1	33.3	+ 22.1
Merseburg Ost	14.1	14.9	32.6	+ 17.7

Key: a--Low-temperature carbonization coke; b--Final degassing temperature; c--Extracted; d--BHT coke; e--Tar content; f--Coke pressure resistance; g--With vaporization; h--Hot briquetting; i--Difference, colume 3-colume 2.

Table 1 shows the increase in low-temperature carbonization of BHT coke resistance for some soft brown coal grades in the GDR when we switch from

the traditional briquetting parameters for the manufacture of coking briquettes (w = 10%, Θp = 75°C, with briquetting material vaporization) to hot-briquetting (w ≈ 0%, Θp ≈ 250°C) (17, 18). Accordingly we can say that, regardless of whether the briquettes are subjected to medium-temperature or high-temperature degassing, the coke strength in all coal types is increased partly more than double due to hot-briquetting as compared to the traditional briquetting conditions. The attainable σ_{pK} level is considerably higher in BHT coke than in low-temperature carbonization coke because, as we know, in the temperature range above 600°C the coke bond still experiences considerable follow-up consolidation (21). On the other hand it is however also unmistakable that, in spite of the always materializing increase in coke strength, we do not get a very solid coke in every case because such influencing factors as the petrographic composition and above all the ash content of the coal also help influence the lump coke formation capacity of the briquettes under the conditions of hot-briquetting. The most solid BHT coke is obtained under the conditions of hot-briquetting with σ_{pK} values of between 26.8 and 33.2 MPa from coal obtained from Lauchhammer, Amsdorf (extracted), and Merseburg/East. This strength level certainly could be used either for a quantitative intensification of hot coke production or for the production of a very high-grade reaction coke with higher heat resistance for the carbide industry whereby in the last-mentioned case of course one can use only ash-poor and sulfur-poor brown coal. Under the existing conditions however we do not yet get genuine smelter coke from hot-briquetting. It would be possible at best that, in case of optimum utilization of all quality-improving reserves in the entire BHT method, one might be able to produce a coke which would be usable in smaller proportions in medium-sized blast furnaces.

In spite of the considerable advantages offered by hot-briquetting when it comes to increasing the brown coal coke strength, this method--apart from some individual cases that will have to be considered quite objectively--according to the current state of the art will hardly prevail when it comes to lump coke production because those advantages have to be obtained through a considerably greater effort before, during, and after pressing.

3.2. Pressing Dry Brown Coal With Coking Aids

The natural lump coke formation capacity of soft brown coal is to be artificially increased by means of the use of coking aids through chemically active substances (17). This would be conceivable if these substances were to make possible the production of considerably more pyrolysis-resistant briquettes through the release of hitherto blocked bonding potentials or through the creation of entirely new bonding forces with simultaneous increase in the pressure plasticity of the coal. Furthermore it would be advantageous if these products would trigger the development of new solid-body bridges at least during the phase of the maximum weakening of the blank bond to about Θ_{Ent} = 400°C. Besides, these substances or their fission or conversion products should above all considerably increase the lump coke formation capacity of the coal during the follow-up consolidation phase of the blank starting at degassing temperatures of over 400°C through direct chemical reactions or through catalytic action.

Among the many successfully tested substances, it was especially the sulfite spent lyes which had been thickened or which had been dried into a powder that proved themselves when it came to the practical implementation of the method on the basis of the attainable effects as well as from the price and raw material viewpoints, provided they are mixed into the dry coal in small quantities according to a certain specific procedure in such a homogeneous fashion that the strength of the briquette bond can reliably be formed through the typical bonding mechanisms of the binderless brown coal briquetting procedure and not through any possibly present glue effects from the substances added. Figure 2 shows the increase in BHT coke pressure resistance through the use of 6 percent of sulfite spent lye dried into a powder ("Groelipell") or 10 percent of thickened sulfite spent lye with a solid content of about 55 percent as coking aid for two types of Niederlausitz brown coal. In these laboratory experiments, coals with a grain size of 1/0 mm and w = 10% were briquetted without briquetting material vaporization at a pressing pressure of p = 100 MPa. Under these experimental conditions, the pressure resistance of the BHT coke mostly goes up by about 10 MPa. Depending on the initial level of the σ_{pK} value, this signifies a strength increase of around 40-100 percent. Here we can observe a basic trend in that, when we use 6 percent Groelipell, as compared to the addition of 10 percent spent sulfite lye, we get a greater increase in coke pressure resistance in spite of the identical dry substance share of sulfite spend lye substance. This is essentially due to the fact that, when we use 10 percent spent sulfite lye, the moisture content of the coking briquettes theoretically goes up by 4.5 percent. On top of that we have the fact that the absolutely necessary homogeneous distribution of these substances among the coal can be accomplished more completely with the powdery Groelipell. It is therefore indicative of the high degree of effectiveness of spent sulfite lye as coking aids that we still get a σ_{pK} increase of around 10 MPa inspite of this great moisture content increase which is rather unusual for coking briquettes. This of course is possible only if the properties specifically found in the substance of both products are considered down to the last detail when it comes to mixing the spent sulfite lye with dry coal in keeping with the method's objective in terms of briquetting and coking theory. Besides, in pressing dry coal with w = 11%, starting with sulfite spend lye shares of more than 5 percent, one should dispense with any briquetting material vaporization (Figure 8). According to comprehensive investigations, the capacities of the method are being used in the best possible fashion for the purpose of increasing the BHT coke strength (17) particularly when we can mix 10 percent spent sulfite lye with dry brown coal having a grain size of Δd = 1/0 mm and w = 6-8% and when this briquetting material mixture is pressed at p = 15 MPa in a steam atmosphere. The σ_{pK} increase under these conditions mostly attains values of far more than 10 and even more than 20 MPa.

Table 2. Pressure Resistance of BHT Coke When Using Coking Aids (Dry Coal Water Content 10 Percent, Pressing Pressure 100 MPa, No Briquetting Material Vaporization)

Kohle 1)		2) Ohne Zusatz	Grünpell 6%	Sulfit-ablauge 10% 3)
Lauchhammer				
4) Koksdruckfestigkeit	(in MPa)	13,3	23,3	24,4
5) Druckfestigkeits-zuwachs	(in %)	100	187	130
Schwarze Pumpe				
4) Koksdruckfestigkeit	(in MPa)	22,1	42,5	31,5
5) Druckfestigkeits-zuwachs	(in %)	100	192	143

Key: 1--Coal; 2--Without addition; 3--Spent sulfite lye; 4--Coke pressure resistance; 5--Pressure resistance increase.

By using spent sulfite lyes as coking aids, assuming we maintain all optimum parameters in the entire BHT method, we undoubtedly have the possibility of making brown coal high-temperature coke whose resistance will permit increased utilization for example in the carbide industry and to a smaller extent also in metallurgy. On the other hand however this method could also be used for the essential expansion of the coke-coal base and for the qualitative and quantitative performance increase of hot-coke production. This method moreover creates favorable prerequisites for the effective utilization--in terms of raw material management--of spent sulfite lye which is a very valuable waste product.

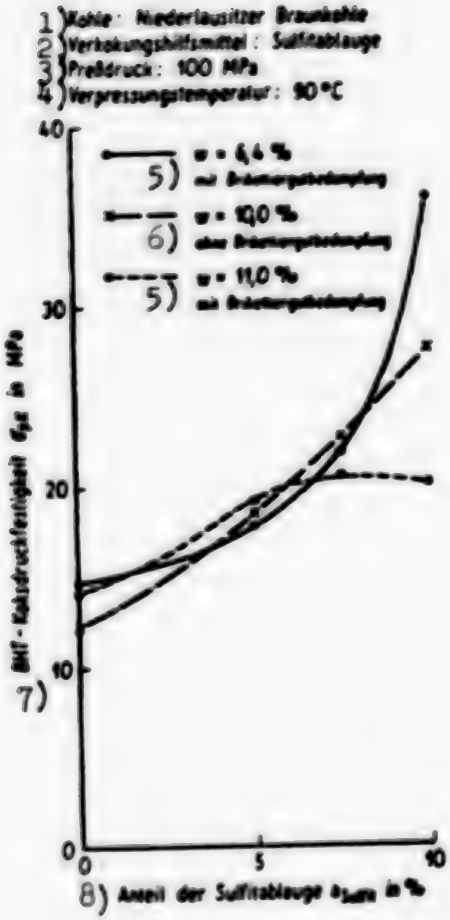

Figure 8. Coke pressure resistance as a function of the coking aid share. Key: 1--Coal: Niederlausitz brown coal; 2--Coking aid: spent sulfite lye; 3--Pressing Pressure: 100 MPa; 4-Pressing temperature: 90°C; 5--With briquetting material vaporization; 6--Without briquetting material vaporization; 7--BHT coke pressure resistance; 8--Share of spent sulfite lye.

3.3. Pressing Dry Brown Coal from Wet-Decomposition Grinding

This method involves a complex technology which starts with the wet-decomposition grinding of raw coal to a very high degree of fineness. The coal/water weight ratio should be adjusted as a function of the mill type preferably in the range of 1:0.6 to 1:1. Through wet-decomposition grinding of raw coal, preferably at 100°C, we get special briquettes with a hitherto unattained lump coke formation capacity in combination with the maintenance of optimum parameters in the dehydration of the coal mash, in the drying and follow-up crushing of the shells, as well as in the pressing phase. By using suitable substances before or after wet-decomposition grinding, we can considerably increase this effect.

Table 3 shows the increase in BHT coke pressure resistance through wet-decomposition grinding for several types of soft brown coal. In most coals, the BHT coke pressure resistance rises to more than 5 or even 7 times the original figure as compared to the traditional briquetting conditions for the manufacture of coking briquettes. The percentage rise of σ_{pK} comes out somewhat less only in the case of the particularly good coking coal from the Schwarze Pumpe Coalfield with a reference value of σ_{pK} = 37 MPa, although the absolute increase here again is still 20 MPa. By using additional substances with a modifying effect before and/or after wet-decomposition grinding, one can further increase the resistance.

The production of coking briquettes from dry brown coal obtained through wet-decomposition grinding, according to the results in Table 3, judging only by the strength, creates justified prospects for the manufacture of smelter coke from ash-poor and sulfur-poor Niederlaustiz brown coal as least for percentage-wise charging into the blast furnaces, especially since this coke, according to more recent investigations (22), is by no means as bad for metallurgical purposes as the absolute numerical values for the ash and sulfur content might have caused us to assume. Besides, by means of this method, we can fundamentally broaden the raw material base for lump coke production. The method even offers favorable prerequisites for the manufacture of lumpy heating coke from West-Elbian low-temperature carbonization coal possibly in modified, environmentally safe vertical chamber furnaces of the "Schwarze Pumpe" design because in that case, in addition to the lump coke and the tar, one could also produce rich gas [coal gas] on the basis of an energy conversion degree of about 75 percent.

Table 3. Pressure Resistance of BHT Coke from Various Brown Coals with and without Wet-Decomposition Grinding

Kohle 1)		2) Bisherige Technologie $w = 10\ \%$ $\Delta d = 1/0$ mm $p = 150$ MPa $\vartheta_p = 80$°C	3) Mit Naßaufschlußmahlung $w \approx 5\ \%$ $\vartheta_p = 80$°C 4) $\vartheta_{Kühl} = 180$°C $p = 150$ MPa
		5) Beide Verfahren mit Brikettiergutbedampfung	
Schwarze Pumpe			
a) sehr gute „Kokskohle"			
6) Koksdruckfestigkeit	(in MPa)	27	57
7) Druckfestigkeitszuwachs	(in %)	100	134
b) schlechte „Kokskohle"			
6) Koksdruckfestigkeit	(in MPa)	8	58
7) Druckfestigkeitszuwachs	(in %)	100	725
Espenhain			
6) Koksdruckfestigkeit	(in MPa)	13	73
7) Druckfestigkeitszuwachs	(in %)	100	600
Merseburg Ost			
6) Koksdruckfestigkeit	(in MPa)	11	56
7) Druckfestigkeitszuwachs	(in %)	100	509

Key: 1--Coal; 2--Past technology; 3--With wet-decomposition grinding; 4--Grinding; 5--Both methods with briquetting material vaporization; 6--Coke pressure resistance; 7--Pressure resistance increase; (a) Very good "coking coal"; (b) Poor "coking coal."

In summary we can say that the production of pyrolysis briquettes from brown coals in the GDR will retain its current position also in the future. According to recent discoveries it is even conceivable that the significance of pyrolysis briquette production might grow at least from the qualitative angle. It therefore seems worthwhile to develop the technology of the overall method in a specifically target-oriented manner especially since wet-decomposition grinding also presents good prospects for the implementation of methods going beyond lump coke production. Besides, the pyrolysis method looks advantageous on the basis of new process-engineering and equipment solutions precisely because of its favorable energy conversion degree also in the future when it comes to substance conversion especially since heating by means of nuclear reactors appears conceivable. On top of that we have the fact that, in the future, the manufacture of high-grade pyrolysis blanks from noncaking or only moderately caking hard coals is bound to gain significance on an international scale (17). We will not go into any further detail in this article regarding the manufacture of gasification briquettes for solid-bed pressure gasification.

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5058
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NATION LOSING TOO MUCH ARABLE LAND TO VARIOUS PROJECTS

Budapest NEPSZABADSAG in Hungarian 31 Aug 79 p 3

/Article by Benedek Toth: "Respect for Our Farmlands"/

/Text/ A great deal has been said in recent years about the value, role and indispensability of farmlands. Indeed, land is the basis of all economic and productive activity. Farmlands, in particular, are the indispensable means of food and raw material production.

Our party program statement calls our farmlands a national treasure; it underlines the need for land use to reflect the common interests of society, working communities and citizens.

The area of our country is 9.3 million hectares. Almost 8.4 million hectares of this total are suitable for agricultural or forestry production; out of this, more than 1.5 million hectares are taken up by forests. Considering the conditions of other countries, we are pleased to see that the percentage of arable land is quite favorable in our country at approximately 90 percent.

An additional advantage we have is that the greater part of our land is of a suitable quality. There are, of course, some weak soils, especially in mountaneous areas and sandy regions; the rational use of such soils represents a considerable task. However, it is quite obvious that during the coming years and decades we are going to see increasing world demand for food, further increasing the value of our farmlands.

Change Is Needed

There has been no disagreement on these points for many years. In spite of this, the total area of our farmlands keeps shrinking every year. During the years after the liberation, between 1945 and 1960, an average of 24,000 hectares of land was removed from agricultural production every year. This is quite a lot of land, even if we consider the fact that about 50 to 60 percent of it was used to plant forests. Nevertheless, the rest of the land was removed from agricultural production once and for all.

This disturbing process was sensibly dampened by the 1961 land protection law. As a result of these stringent measures, by 1968 the total area removed from agricultural production per year was reduced by almost two-thirds. Subsequently we started again to lose more farmland. Perhaps one of the reasons was that the 1969 modification of the land protection law rasied the lower limit for required ministry permits for land utilization from 12 hectares to 30 hectares.

Eight years later, in 1977, there were rigorous measures of another kind; however, we still cannot be satisfied. During the Fifth Five-Year Plan we expect a reduction in farm acreage of approximately 60,000 hectares. Unfortunately, today it is obvious that this target will be overfulfilled by a large margin. Thus, there is a definite need for a change in the portection of our farmlands, coupled with a possible increase in the quantity and rational use of arable land.

We cannot draw consolation from the fact that the shrinking of farmlands is not a specifically Hungarian phenomenon. Wasteful land use should not be condoned on the grounds that the utilization of farmlands for other, mostly nonagricultural, purposes is in fact inevitable in a certain phase of economic and social development. New roads, industrial plants, residential buildings, warehouses and feedlots must be built; however, a great deal depends on the location, acreage and quality of soil at the site of new structures.

The land protection legislation currently in effect states that investment projects must be located primarily in areas which are not suitable for agricultural production. If this is not possible, one must use weaker quality soils. Good soils can be used only in exceptional cases, under very strict conditions. Thus, the legislation is clear, unequivocal and rigorous. In spite of this, there are too many "exceptional cases" and agriculture is losing more land than necessary in each and every year. For example, the measures taken in 1977 provided for a substantial increase in the sums to be paid for land use. However, they were not successful in insuring that the enterprises using the land are made to feel the burden of these sums instead of transferring the cost, directly or indirectly, to the state budget.

More Rigorous Protection

One problem is the leniency shown by precisely those council authorities charged with the primary task of the unequivocal and strict enforcement of land protection measures. One of the reasons behind the leniency is that counties, cities and larger communities are in fact competing for new industrial investments and divisions of national enterprises due for relocation. Favorable site grants can have a substantial influence on the final decision regarding the site of the much-wanted industrial complex. Unfortunately, considerations of farmland protection are often relegated to secondary status in these cases.

The legal confusion in the area of land protection legislation and construction regulations relating to urban development represents another irritating factor. In our country, every community of a certain size must prepare a general urban plan. These plans encompass an extensive period (30 years) and they are rather broad. Quite often they envisage the use of more farmland than necessary. Later the lands included in these calculations must be regarded as part of the core area of these communities and therefore it becomes easier to utilize them for other purposes.

This irregularity is indicated by the fact that at present the core area of larger communities contains 45,000 hectares of land which is under large-scale cultivation by agricultural cooperatives and state farms. Therefore, it is important to prepare general urban plans on a more modest scale, to reduce the core area of communities in a rational manner and thus provide better protection for these lands.

Protection of our farmlands demands careful work in many areas. Many indirect dangers are threatening these lands. Water, the source of life, can also cause a great deal of damage in some cases. In addition to floods, we must consider the silent enemy: inland waters. These have caused the elimination of rather large areas from agricultural production: the average of the last 20 years was 130,000 hectares. At least 100,000 hectares out of this total consists of good farmland. Using well-known methods of water management, these lands may be freed from inland waters; according to reliable calculations, the resulting extra agricultural production would pay for the cost of water management measures within 3 to 4 years.

How To Increase?

It is well-known that the areas surrounding water reservoirs and canals are plagued by water seepage. Unfortunately, the areas adjacent to the Eastern Main Canal and the Tisza-2 provide an excellent opportunity for a post-mortem study of this process.

Of course, this water seepage is not an act of nature. It could be prevented with better insulation and we could eventually gain a great deal using this method, despite the additional costs. It is almost impossible, however, to install insulation after the canal has been built. Therefore, water management specialists came up with the idea of planting leafy forest belts along canals at a distance of 40 meters on either side; these trees will evaporate the water seeping from the canals.

Many people are (rightly) opposed to this scheme on account of the amount of land it would require. Instead, they are proposing the building of peripheral ditches running along canals: these would collect the water which could be pumpted back to the canal.

Wasteful reduction of farmland acreage may result from forest belts planted to provide a so-called "snowshield," in addition to the so-called "evaporation" forest belts planted along canals. Such "snow shield" forest belts have a combined length of approximately 2,000 km along the highways; they occupy at least 5,000 hectares of farmland. The planting of additional snow-shield forest belts is obviously not desirable. Gradual reexamination and gradual elimination of existing ones could result in the addition of about 6,000 to 7,000 hectares of farmland nationally. Their replacement with hedges and rows of trees should be considered.

Lowland forests were reevaluated in recent years with a view toward returning good-quality lands to agricultural production following the harvesting of trees. This could result in renewed cultivation of approximately 10,000 hectares.

It is also well-known that poplar trees (for cellulose) were planted during the 60's on about 40,000 hectares of agricultural land. Through the reevaluation of good farmlands on which poplar trees were planted and the gradual harvesting of those trees, it will be possible to return 30,000 to 35,000 hectares ot agricultural production. The planting of poplar trees is justified on low-quality soils.

Rational Utilization

During the Fifth Five-Year Plan new forests will be planted on 45,000 hectares; during the Sixth Five-Year Plan, the planting of an additional 45,000 hectares is foreseen. In the future, 80 percent of new forests will be planted in areas used by agriculture; only 20 percent will replace harvested forests. Although this plan may seem surprising, it is correct, since we still have quite large areas categorized as agricultural land which are in fact unsuitable for economical use for agricultural purposes.

It is important that we do not forget the principle that "little things add up." Outlying areas of communities contain much land which is no longer used for other purposes and can be made available for agricultural cultivation at a cost that varies with the circumstances. Among these are unused roads, railroad tracks, loam pits, farms and other sites. Just one example: at the beginning of the year, land management offices counted 7,520 decaying farms. These are no longer inhabited and in many cases the surrounding yard and garden is not being cultivated by anyone. Careful and rapid measures are needed to make them usable again.

Much farmland may be restored to agricultural use by reexamining, individual cases, the present use of land removed from agriculture in the past. It is quite obvious that at the time of the establishment of certain installations the land requirements were excessive. There may be many advantages in better use of farmlands adjacent to public highway, canals and dams.

Beyond these consideration, suitable and rational cultivation of farmland represents a very important task. This is required by existing legislation. The aim is not only to avoid uncultivated lands. It is at least that important to arrive at a suitable crop structure by taking into account the traditions and possibilities of local production. Each crop must be cultivated on the most suitable soil, if possible.

Fortunately, the present agrarian policy and material incentives are encouraging conscientious cultivation of land by large- and small-scale producers as well as the owners of household plots. The resulting harvests provide proof that our farmlands are in good hands.

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IMPROVED INCENTIVE SYSTEM DECREED FOR AGRICULTURE

Budapest PARTELET in Hungarian No 8, 1979 pp 37-41

/Article by Dr. Ferenc Vendegh, Main Department Head of Ministry of Finace/

/Text/ The 15 March 1978 resolution of the Central Committee outlined main trends of regulation system development in the fields of agriculture and the food industry. It established that further development of incentives should provide better stimulus for greater output and improvement of quality and economic efficiency. Enterprises, state farms and cooperatives that continuously have above average economic achievement should receive greater material and moral recognition than in the past, and adequate attention must be devoted to accelerating development of those that are lagging behind their capabilities. These requirements must be met continuously and in a manner that improves efficiency and corrects the structure of agricultural production, making it conform better to the changed foreign trade conditions without damaging the satisfaction of domestic demand. Because of the cooperative characteristics of the agriculture branch this will require continutation of a pricing and financial regulatory system differing from that of other branches of the national economy.

Analyses show that the previous price and regulatory systems have been basically adequate for the established goals. It has also become apparent, however, that the economic requirements deriving from the changed situation showed the price and regulatory system to be weak in many points and contradictory in others. Although it did further dynamic growth of agricultural production, it lacked sufficient effect on production efficiency and did not sufficiently direct the enterpriese focus on and to expedite and exercise frugality in cost management. Because of this, regulation will set a generally higher standard for enterprise management in the future, a basic concept of which will be that prices and price ratios should provide greater incentive for attainment of production goals and for improvement of quality and efficiency. Centralized support should become simpler and more comprehensive, and should primarily assist development of the structure of production, greater economic efficiency of investments, and better exploitation of capacities. The following major changes will be made in 1980 in the price and regulatory system to insure attainment of these goals.

Raising State Procurement Prices

The price levels for state buying-up of agricultural products will rise an average of 10 or 11 percent, while support will decrease. The differentiated increase in procurement prices may stimulate the plants to establish a more economical production structure. The fact that prices in the future will depend more on product quality will serve to satisfy the more demanding domestic needs and will also serve to expand the base of export goods base.

An increase of 6 or 7 percent on the average may be expected in agricultural crop prices, and increases of 13 or 14 percent may be anticipated in livestock and animal product prices. This will result in greater involvement of agricultural installations in the production of animal products in the future, the production of which is accompanied by greater risk.

A still greater increase in state procurement prices was prevented by several circumstances. Producer and consumer prices cannot be separated too much from each other. In the case of a greater price increases the free market of price levels of products would have skyrocketed. It is not expeditious to provide to recognize unjustifiably high costs /production/ in prices because this does not provide incentives for improving efficiency and may also reduce the export capability of agricultural products.

It must also be taken into consideration that increasing state procurement prices and the prices of capital equipment obviously offers a greater advantage for the farms with better quality soil. Increasing the production costs of farms with poor quality soil will not be much less because of a reduction in state subsidies and in certain cases may be greater because of terrain conditions, while yields may often be 30 to 70 percent lower. A greater increase in state procuremen' prices would have unjustifiably increased the difference in revenue that is independent of the level of efficiency of economic management.

Because of the above, and other causes, state support of agriculture will continue at very substantial levels. Its magnitutde may be placed at about 16 percent of agricultural product price receipts. Even with a 10 billion forint reduction in subsidies, the prices of machinery and spare parts will increase by 25 percent, artifical, fertilizer will increase by an average of 15 percent, pesticides by 25 percent, and mixed fertilizer by 15 to 17 percent.

Investment Subsidies

Subsidies for capital investments will decrease by approximately one-third. In contrast to previous practice, subsidies will be broken down into basic subsidies and supplementary subsidies, which more directly furthers realization of production policy goals. Enterprises may rely on basic subsidies for long-range periods, and on supplementary subsidies for shorter periods.

Agricultural enterprise leaders will have greater responsibility in the future to decide on investments. Avoidance of expensive solutions is a basic requirement to consider in construction projects. A greater portion of developmental funds must be devoted to purchase of machines and installations that enable better expolitation of existing production capacities. Investment subsidies also extends to the development and improvement of croplands.

The system of conditions for continued investment subsidies remains basically unchanged. Production enterprises showing better results will continue to receive a greater portion of state investment subsidies because these installations have greater potential strength and better credit ratings. Within the framework of automation this is the only way in which excessive channeling of state support to regions with poorer characteristics may be avoided. Efficacy of investment is generally lower in these regions, and this would lower the efficiency of the entire economic branch.

Increased economic production is furthered in big agricultural installations that are lagging in relation to their developmental capabilities by reducing land and income taxes. The funds liberated by this measure cover a more rapid rate of growth in these large plants, increasing the possibilities for acquisition of equipment necessary for better exploitation of their production capacities. This procurement is based mostly on credit buying. In addition, individual measures in 15 to 20 large agricultural installations in 6 to 8 megyes each year aid agricultural plants that have become retarded in their development for various reasons and thus repeatedly struggle with economic management and financial difficulties to stay solvent. These individual measures are based on studies of the entire economic operation and leadership.

From the above it is apparent that credit will acquire greater importance than in the past in the economic operation, development, and incentive relationships of big installations. As the most elastic element of regulation the use of credit may suitably assist solving occasional difficulties arising from the application of normative regulation.

No change in support, and price supplements is contemplated for big installations with unfavorable economic operation characteristics but developmental support, and support providing incentive for specialists will continue. Price subsidies is broken down into basic subsidies and supplemental subsidies. The aim of the latter is to insure that big agricultural installations are more interested in increasing production of plant and animal products more suited to the plant's characteristics and that they increase plant cultivation more favorable to the individual enterprise, thereby assuring coordination between the area of cultivation and natural and ecological conditions.

Remuneration for development of agricultural activities will continue for cooperatives with unfavorable conditions for non-agricultural development. Part of this subsidy may be expended for procurement of machinery and for

development of marketing service activities, particularly those that produce favorable economic results. These expenditures would be emphasized for this support rather than investments demanding large funds.

Development of the Tax System

The incentive system, taxation and regulation of wages will emphasize identical elements among state farms and producer cooperatives in the future without, however, relegating cooperative peculiarities to the background.

Yearly state farms contributions for city and village development like those of cooperative will constitute one percent of their gross income. The land tax will continue to be uniform, although its method of computation will be different. Large agricultural enterprises operating on the best lands will pay somewhat more land tax in the future, and those with medium quality lands will pay less. The previous land tax benefits or exemptions will continue in force. It is anticipated that the tax computation method will be modified in a manner that the ratios of types of agricultural operations (plowland, vegetable production, or meadow and pasture) will have neither favorable nor unfavorable effects on the total tax. This form of taxation will contribute to meeting the condition that the agricultural tax system draw off the various contributions to a greater degree and hinder differences in income independent of the level of economic operation.

Depending on their gross revenue, state farms in the future, will continue to pay tax from their profit. Plants with lower gross income will pay less tax in the future than at present, and those with higher gross income will pay somewhat more. The tax progression will continue to depend on gross income per capita. The method of computation of personnel will not change.

Ongoing development of industrial, service and commercial activities in the big agricultural installations will remain of vital interest to the national economy, the cooperatives and the enterprises. Large agricultural plants have been involved in this process in the past, also. This is indicated by the fact that this activity has surpassed 10 percent per year. Development of these activities in the future will be influenced to a greater extent by the production tax on so-called sector differences. Large agricultural plants pay less tax in relation to their profit than do industrial enterprises: they are not required to make central remittance from their amortization, whereas industrial enteprises have a 40 percent central payment requirement. In the interest of creating identical buget relationships the production tax and the separate production tax are paid by cooperatives listed in the agricultural-industrial or industrial-agricultural categories, or those that extend their industrial or service activities in Budapest or in the spheres of influence of the five large provincial cities. This activity can be an important source of increased income primarily for

cooperatives with unfavorable characteristics, and because of this the involvement of these cooperatives is increased by the fact that they may withhold 60 percent of the computed production tax for increasing output, and pay only 40 percent.

There will be continued interest, and in some areas more interest, by the large agricultural enterprises and general consumer and marketing cooperatives to increase the services for expanding the quality of activities that serve to intergrate production of the household plots and auxilary farms. In the future large agricultural enterprises with unfavorable characteristics will receive price supplement supports for milk and berries received from other small producers in addition to household farms. In addition, all large agricultural enterprises may continue to share the large enterprise premium with small producers in accordance with local conditions and within the provisions of the law.

Interest in the small scale producers will be undiminished. In almost all respects they will enjoy the same support as large enterprises. In the future no tax need be paid on wages paid for raising and fattening livestock on household farms.

Tax on wages will be the same in state farms and in producer cooperatives. Similarly to the present practice of cooperatives, the possibility of tax-free raises in wages during the course of the year within the framework of average wage regulation will continue to depend on level of the wage scale. In farms where the level of income is low, there will be relatively greater possibility for a tax-free raise, whereas this possibility will be lower in farms paying a higher wage.

Significant preferences will continue to mitigate the well known disadvantages of average wage regulation. The amount of year-end tax-free profit sharing will depend on the level of profit per capita and on the level of wages and work fees during the year. Farms in which the wage level is medium to low but per capita profit is high will have greater possibility than in the past for providing material incentives. Farms offering high personal income but attaining low profits, on the other hand, will be able to provide less tax-free personal income than in the past. It must be emphasized that personal income may be raised only where this increase is covered by profits. Thus there will still not be a "state guarantee" for wage raises.

Planned taxation of wages will somewhat moderate the unjustified differences in fees for services. At the same time it provides a means for large agricultural enterprises that function efficiently and attain greater profits to distribute more profits through year-end profit sharing.

Separate taxation of wages during the year and year-end profit sharing is advantageous because it may reverse the unfavorable trend developed during recent years in which a considerable portion of cooperatives paid no year-end profit sharing at all, or reduced the ratio of profits shared from year to

year. Year-end profit sharing will be stimulated also by the fact that similarly to other branches of the national economy cooperatives in the future will not contribute to the Trade Union Social Insurance Center on the basis of year-end profit sharing.

Another aspect not to be overlooked is that regulation of wages and fees for services during the year based on the average wage at least in theory provides incentive for weakening the manpower, while the new system of supplementary sharing does the opposite. On the basis of the above large agricultural enterprises, in accordance with their interests, may conduct simpler manpower management than in the past, which fact was deemed important by the aforementioned resolution of the Central Committee.

With Thorough Political Preparation

It may be understood from the above that the planned modifications in the incentive system of large agricultural enterprises demand not only economic, but very thorough political preparation. It is certain that the effects of increasingly difficult foreign trade conditions tranmitted through the price and regulator system will confront large agricultural enterprises with a more difficult task than before. Because changes in the regulators reflect objective economic processes, we must strive to insure that ever more persons not only understand the need for measures, but actively participate in the preparation and execution of the increased tasks. This is very responsible political work.

Both enterprise and regional party organizations have a large role in insuring that the new demands not get stuck at the large enterprise centers. They should formulate the tasks in a practical manner, according to independently accounting organizational units, so that they may be understood by the broad masses of workers. It is very important that prior to enterprise decisions in general, and especially in relation to investment decisions, analyses be performed with circumspection, and that the economic leaders be stimulated to make cost-sparing but expeditious solutions, especially concerning construction work.

Creation of widespread material incentives among independently accounting economic units may represent a substantial resource. The basic prerequisite for this, however, is that the goals be realistically defined, and the work of individual independently accounting units be coordinated to agree with long range economic interests and with the demands of the national economy. Who receives fees for services on the basis of work actually performed or on the basis of work results among enterprise personnel has been a political question in the past, and will be even more so in the future. Special attention should be devoted to differences in indices of achievement of workers performing under virtually the identical conditions, such as in the specific consumption of fodder, spare parts, etc., or in the cost-benefit ratio in general.

Without convincing political work the present equalization in income that has been developed cannot be made proportionate to performance. This, however, is an indispensible means for increasing efficiency.

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GDANSK-WARSAW GRAIN BARGE SYSTEM DESCRIBED

Warsaw PRZEGLAD KOMUNIKACYJNY in Polish No 5, May 79 pp 175-177

/Article by Andrzej Ciesliczak: "Grain Transport on the Vistula from Gdansk to Warsaw"/

/Text/ In the fall of 1975 the construction of the grain elevator of the District Grain-Milling Industry Enterprise in Warsaw was completed. The elevator is located on the Zeran Canal. It has its own siding for the unloading of grain from railroad cars and, among other installations, special equipment making possible the direct unloading of bulk grain from barges.

This equipment consists of suction spouts and a conveyor belt. In 1976 the Warsaw Navigation /enterprise/ began grain deliveries to the elevator by water transport. The lack of an appropriate number of barges and unfavorable navigation conditions brought it about that the quantity of deliveries was relatively insignificant, amounting to 936 tons.

In 1977 a substantial increase of deliveries occurred. After the adaptation of part of the fleet on hand for this type of transport, 18,800 tons were transported. A further increase (to about 45,000 tons) occurred in 1978.

The Waterway

The grain is transported from Gdansk to Warsaw on the Vistula, over a distance of about 450 km. The segment of the river from Plock to Warsaw is not regulated. Significant navigational difficulties intervene in this part of the river, as well as periodical low water levels which reduce the loading factor of the barges or prevent navigation altogether.

On the Plock-Wloclawek segment the navigation conditions are good and permit shipping operations through the entire navigation season.

On the Wloclawek-Gdansk segment the navigation conditions are good, but are subject to deterioration during low-water periods, especially in the Wloclawek-Ciechocinek segment (effected by the operation of the electricity generating station).

Over the entire distance there are three locks: in Warsaw at Zeran, in Wloclawek and in Gdansk-Przegalina.

The size of the locks permits the lockage of the entire transport assembly (barge train and tug), with the exception of the Przegalina lock, where the barge train can be put through the lock without the pusher tug.

Transport Technology

In 1978, 6 pusher tugs of the "Zubur" /Bison/ type and 12 BP-290 barges with manually removable covers were allocated to grain transport.

The pusher tugs travel in assembly with two barges. The full length of the assembly is 83 meters, and its capacity 400 tons.

The pusher tugs work permanently with the same barges. There is no provision for the use of reserve barges. The assemblies are worked around-the-clock. The technological norm for a single round trip (Warsaw-Gdansk-Warsaw) is made up of the time components shown in table 1.

Table 1. /Time Norms for a Round-Trip Warsaw-Gdansk-Warsaw/

	Hours	24-Hour Days
Downriver travel	55	2.29
Upriver travel	84	3.50
Harbor stay in Gdansk	24	1.00
Harbor stay in Warsaw	24	1.00
Total	187	7.79

On the average, an assembly can complete four round trips a month. With full utilization of its carrying capacity, an assembly can transport 1,600 tons/month, and the carrying capacity of the fleet allocated to grain transport amounts to 9,600 tons/month.

The loading of the barges in Gdansk takes place either directly from the seagoing ship or from the elevator of the State Grain Works, and the unloading at the elevator in Warsaw is effected by means of the above-mentioned pneumatic equipment and conveyor belt system.

The Navigation Period

Owing to the freezing over of the Vistula in winter, operation of the waterway is feasible from 1 April to 30 November, that is for 244 days. In certain years deviations from these dates may occur. In 1978 shipping started in the second half of March.

Transport Results Attained in the Period 15 March to 30 September 1978

Up to 30 September 1979 a total of 33,735 tons of grain was transported. For a closer analysis of the work of the fleet engaged in grain transport,

a tabulation has been compiled showing the volume transported in individual months, the number of round trips, and the travelling and harbor layover times per pushed /barge train and tug/ assembly (table 2).

In veiw of substantial disruptions which occurred in August and September, the tabulation shows separately the results attained in the March-July period and those for the March-September period.

With maximal utilization the transport capacity of the fleet for the March-September period come to:

9,600 tons/month x 6.4 months = 61,440 tons.

Losses owing to unfavorable navigation conditions (reduction of the load factor of the barges) per transport assembly and round trip came to:

400 tons - 341 tons = 59 tons,

and total losses for the period under investigation amounted to:

6 assemblies x 4 round trips/month x 6.4 months x 59 tons = 8,950 tons.

Hence the net transport capacity of the fleet came to :

61,440 tons - 8,950 tons = 52,490 tons.

In result of the transgression of the time norms per round trip, only 99 round trips instead of 154 were achieved. Hence the transport losses stemming from the lengthening of travel time amount to:

341 tons x (154 - 99) = 18,755 tons.

For each day by which the average round-trip travel time was lengthened /the loss/ thus comes to:

18,755 tons/4.02 days = 4,665 tons.

By allocating the above losses to individual elements of the round trip, we obtain the following:

--a gain resulting from the shortening of downriver travel time:

0.03 days x 4,665 tons = 140 tons;

--a loss resulting from the lengthening of the upriver travel time;

0.15 days x 4,665 tons = 700 tons;

Table 2. /Statistics on March-September 1978 Grain Transport Performance/

	(1) Miesiące							(2)	(3)	(4)	(5)	(6)
	III	IV	V	VI	VII	VIII	IX	Średnio III—VII	Średnio III—IX	Normatyw	Różnica (11—9)	Różnica (11—10)
1	2	3	4	5	6	7	8	9	10	11	12	13
(7) Wielkość przewozowa w tonach	1919	4455	6704	5402	6071	5877	3587	24271	33735	x	x	x
(8) — Liczba rejsów	5	13	19	17	18	17	10	72	99	154	—	55
(9) Średnia nośność zestawu (w t)	303	342	356	313	337	346	359		341	x	x	x
(10) Jazda w dół rzeki (w dobach)	2,40	2,46	1,84	2,35	2,00	1,71	4,00	2,15	2,20	2,29	0,14	0,01
(11) Jazda w górę rzeki (w dobach)	4,80	3,69	3,84	3,76	3,72	2,76	3,90	3,83	3,65	3,50	-0,33*	-0,15*
(12) Postój w porcie Gdańsk (w dobach)	5,00	4,07	2,21	1,32	1,78	1,47	3,10	2,78	2,59	1,00	-1,78*	-1,59*
(13) Postój w Warszawie (w dobach)	2,80	2,69	1,63	2,35	2,22	4,82	6,60	1,90	2,94	1,00	-0,90*	-1,94*
(14) Remonty — awarie (w dobach)	—	0,93	0,26	0,29	0,61	0,18	0,40	0,46	0,37	—	-0,46*	-0,37*
(15) — Razem (w dobach)	15	13,85	9,78	10,58	10,33	10,94	18,00	11,20	11,81	7,79	-3,41*	-4,02*

Key:

1. Months
2. March-July average
3. March-September average
4. Norm
5. Difference (col. 11 - col. 9)
6. Difference (col. 11 - col. 10)
7. Transport volume (tons)
8. Number of round trips
9. Average load per assembly (tons)
10. Length of downriver trip (days)
11. Length of upriver trip (days)
12. Length of Gdansk port stay (days)
13. Length of Warsaw port stay (days)
14. Repairs, accidents (days)
15. Total time (days)

/Note: Days = 24 hour periods/

--a loss resulting from the lengthening of the layover time in Gdansk:

1.59 days x 4,665 tons = 7,417 tons;

--a loss resulting from the lengthening of the layover time in Warsaw:

1.94 days x 4,665 tons = 9,052 tons;

--a loss resulting from accidents:

0.37 days x 4,665 tons = 1,726 tons.

A tabulation of the losses is presented in table 3 here:

Table 3. /Train Transport Capacity, Losses and Actual Utilization, Mar-Sep 1978/

(1) Wyszczególnienie	(2) Wielkość (w t)	%	%	%
(3) Zdolność przewozowa brutto	81 448	100		
(4) Zdolność przewozowa netto	52 490	85,4	100	
(5) — Wielkość przewozów*	33 723	54,9	64,3	
(6) — Straty w przewozach	18 735	30,5	35,7	100
(7) — Wydłużenie czasu jazdy	560		1,0	3,0
(8) — Przestoje w Gdańsku	7 417		14,2	39,5
(9) — Przestoje w Warszawie	9 052		17,2	48,3
(10) — Awarie	1 726		3,3	9,2
(11) — * wielkość rzeczywista				

Key:

1. Specification
2. Volume (tons)
3. Gross transport capacity
4. Net transport capacity
5. Transport Volume *
6. Losses of transport /capacity/
7. --Lengthening of trip time
8. --Demurrages in Gdansk
9. --Demurrages in Warsaw
10. --Accidents
11. * Actual volume

Causes of the Transport Losses

The underutilization of the full loading capacity of the grain barges resulted from the navigational difficulties (low water levels) which occurred on the Warsaw-Plock sector.

An improvement in this sphere may appear after the implementation of the "Vistula" program in the middle and lower reaches of the river.

The lengthening of travel time in comparison to the norm constitutes a relatively insignificant cause of transport capacity losses. Similarly, losses owing to repairs and accidents are not high. The elimination of these losses depends above all on the /Warsaw Navigation/ (repairs, accidents).

Losses stemming from demurrages in Gdansk arose as a result of the barges having to wait for loading.

Demurrages of the barges in port during the last period resulted from long-lasting storms in the Baltic. Losses from this cause can be reduced by increasing the proportion of barge loadings from the elevator. Losses on account of demurrages at the elevator stemmed above all from the necessity of accepting grain from the fields in August and September and the resulting need to fill up the elevator. A part of the demurrages at the elevator stems from a lack of continuity of pace in the loading work of the port. The simultaneous loading of several barge assemblies increases the waiting time for unloading and disorganizes the rhythm of shipment.

Possibilities of Increasing the Transport Volume

Altogether about 45 thousand tons of grain were transported in the March-November period.

In the upcoming years the requirements for grain transport will amount to about 100 thousand tons for the elevator in Warsaw-Bialoleka and about 100 thousand tons for the elevator in Plock.

If we assume an average round-trip period of 10 days for the Bialoleka elevator and an average round-trip length of 8 days for the Plock elevator, the fleet requirements will be the following:

--for the elevator in Warsaw, 12 tug and barge-train assemblies;

--for the elevator in Plock, 8 tug and barge-train assemblies.

For transporting the 200 thousand tons of grain, 20 assemblies (20 tugs and 40 barges) will have to be allocated. At the present the /Warsaw Navigation/ enterprise does not have a fleet of this size. It is envisaged that in the near future a new type of barge will be commissioned which is specially designed for grain transport and will have a capacity of 400 tons.

The annual transport capacity of the new tug and barge-train assembly will amount to the following:

--for shipments to Warsaw (85 percent utilization of the load capacity): 16,592 tons;

--for shipments to Plock (100 percent load capacity utilization): 24,400 tons.

The introduction of the new barge model and the completion of the fleet with propulsion by means of new units of the "Koziorozec" /Capricorn/ type will raise the productivity per worker. With the equipment utilized at the present the annual productivity per worker in these shipments comes to 833 tons.

For the shipment of 100 thousand tons of grain to the elevator in Warsaw 6 /new/ tug and barge-train assemblies will be needed. For the shipment of 100 thousand tons to the Plock elevator 4 assemblies will be required. The joint requirement for the fleet thus comes to 10 pusher tugs and 20 barges. The productivity per worker engaged in the shipments will amount to 2,222 tons.

The introduction of the new barge model for the Gdansk-Warsaw linkage will permit a doubling of the transport volume with the same number of pusher tugs.

Until the new fleet is put into operation, an increase in the transport volume can be attained by means of a shortening of the demurrage time in the port and at the elevator. A reduction of the layover times by 50 percent would permit an increase in the annual shipment volume from 45 thousand tons to 53 thousand tons.

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KRAIGHER DISCUSSES INFLATION, EMPLOYMENT, DEVELOPMENT

Ljubljana DELO in Slovenian 8 Sep 79 p 25 AU

[First part of article by Sergej Kraigher, member of the SFRY Presidency: "We Must Assess Social Development and Its Contradictions With Our Own Criteria"]

[Text] We possess accepted guidelines on inflation, stabilization and qualitative factors in Slovenia, too. They are documents of the League of Communists, social plans and resolutions on the development policy, trade union positions and the positions and guidelines of the SAWP and the Youth Federation. These guidelines do not require any different foundations or any particular changes or amendments, but they probably require application particularly in connection with events on the international, Yugoslav and Slovene scenes. This application, however, must be closer to the actual needs of the workers, and the working men and citizens under the conditions of socialist self-management.

Inflation Must Be Removed at Its Sources

When we discuss inflation, we all agree that it is damaging, but we are incapable of removing the sources of inflation which we have basically already identified and we are incapable of following up the effects of certain measures which would help overcome inflationary trends. In analyzing the situation we still predominantly deal with the outside expressions of inflation. It is on the basis of those outside expressions that we plan activities and also make assessments of our economic situation and economic trends. For this reason we are contradictory and ineffective in our activities.

Let me mention a few examples: We speak about an increase in prices, but we do not dig deep to establish the causes for the increase, to find out which are those phenomena and relations in the Yugoslav economy and in its structure which lead to an increase in prices and to constant pressure in that direction. I think that we should move from a simplified following of the economic trends according to indices and analyses of prices on this basis--which in essence is correspondingly

barren--onto structural analyses of economic trends and corresponding price fluctuations and changes in price relationships, their reciprocal influence and effects and their consequences. We should, of course, acquire the skills for this. Without an analysis of what relations we create in the economy and society through price increases and the changes in the price relationships, what we solve in this manner and what new complications arise in the economy and in the solving of the tasks on which the Yugoslav balance of payments depends, without harmonizing supply with demand and without examining the influence on the stability of the market, it is possible to achieve only short-term and double-edged effects through price increases and, on the other hand, through price freezes. Freezing prices has not yet stabilized the market anywhere in the world, but instead leads to greater bureaucracy, to strengthening the administrative apparatus and its power. This usually ends in strong state intervention with undesirable political consequences and attributes or, at the other extreme, giving in to pressures.

From Simplified to Structural Analyses

In our country we encounter both aspirations, and in that connection I would also add to the second aspiration the tendencies of long obsolete economic liberalism, which in the modern situation again calls for a strengthening of the role of state organs. In that respect the political action and the work of the sociopolitical organizations can produce results solely if they are accompanied not so much by so-called action programs, but rather by persistent and planned work of all those responsible in the social basis itself, particularly of workers councils and their organs and professional services, for the removal of causes. Naturally, that applies to the same or even greater extent to all pertinent administrative organs and such organizations as the National Bank, institutes for social planning and the social accounting service.

Or let us take the example of the personal income trends in Slovenia. Some people consider that a growth of personal incomes barely exceeding the cost of living increases conveys the subsiding of one of the manifestations of inflation. I believe that we cannot be satisfied with this or interpret it as a success in the sense of economic trends and pressures on prices calming down. Self-defense measures by the workers in our self-managing society are working here against the negative effects of inflation on their standard of living, for at the present stage of our self-managing social development we have in essence reached the point where the decisive role in determining the allocation of income for personal incomes is most certainly played by the workers. This is expressed in such a way that the basic organizations as a rule do not allow their real personal incomes and their standard of living to fall--or at least to fall perceptibly--because of the increasing cost of living. In fact, their real personal incomes are, on the average, constantly increasing.

In Providing New Jobs We Are Still Burdened by Ambitions of Developed Regions and Communes

There is a similar case with employment. Some people believe, and in some analyses we find assessments that there is great success in the way in which we employ people, without trying to analyze the structure of employment or the way in which it is harmonized with the solution of the basic problems of our economic and social development, with the growth of productivity and employment, particularly in those regions where reserves of active population exist. I believe that this level of employment, particularly as demonstrated in the analyses at our disposal, should instead be assessed as a failure. However, employment anywhere in Slovenia or Yugoslavia, which is above the planned level and structurally unsuitable--even according to the still incomplete statistical data--shows that we have not mastered the inflationary trends and that we are not sufficiently aware--or at least that we are not sufficiently consistent [as published]--of their real causes. We must train ourselves to carry out detailed analyses of employment, its structure and economic consequences and to influence inflation and its trends. There is certainly no reason why employment in Slovenia should increase at an annual rate of 3.6 percent, which is considerably more than we envisaged in the medium-term plan (2.9 percent per year). If we also look at the structure of employment then the problem becomes even more delicate. And if we also consider the questions as to where new jobs are provided in the economy, we can establish that we are still burdened by the ambitions of the developed regions and communes, or rather by the responsible sociopolitical and economic factors, to open and to build new plants in their regions and communes, although at the same time they complain about the shortage of workers and the unsuccessful advertisements for jobs, instead of developing production in those regions and areas, or rather republics and provinces, where workers are available.

These are concrete questions which are understandable to everyone and which we should discuss more broadly and in a more overt manner in public. I even think that in that respect we could resolve some of the problems more easily with the help of public opinion, although it would not always be the most pleasant for the responsible economic and sociopolitical workers.

To Establish and To Assess the Quality of Changes in the Structure of Production and Investments

We continue to speak about the growth of production and we compare social product at current prices and the physical volume of production and on this basis we establish positive elements in our economic trends, but without analyzing and assessing the structure of production and national income and their changes compared with the changes in the growth of consumption and in the individual kinds of consumption, that

is with the changes in its structure. In short, in this connection, too, we do not seek answers as to what this kind of growth of production resolves, or rather how it enables us to overcome the sources of inflation or where it even strengthens and encourages the sources of inflation, particularly with unsuitable employment and with an unsuitable productive consumption, low productivity and with personal incomes which are in no proper relations with productivity.

We continue to speak about high investments and too large a number of investments. Certain changes in the structure of investments to the benefit of energy are shown here in accordance with the social plan. However, when the more complicated task is involved which we set clearly and precisely in the medium-term plan, that is a restructuring of the processing industry and its preparation for foreign markets, both as regards its production and supply and productivity and other elements of competitiveness, then the present manner of following as a method of analysis and assessment of investments fails, and the present forms, manner and method of social influence on investments and their effectiveness also appear as unreliable and insufficient. Also in this connection our measures are in many ways similar to the developments in the world, but because of the independence of workers in the basic organizations of associated labor, an insufficient concentration of capital in suitable forms of association of labor and pooling of resources and the activity of our banking and monetary system, including the role of the National Bank, which is not adapted to the self-managing position of workers in the basic organizations of associated labor there is the possibility that these measures will yield even less satisfactory results. A solely political or predominantly political action, which I do not underestimate, certainly cannot cope with all these tasks.

Self-Management Consists of Social Possibilities for Solving Problems of Inflation, Its Causes and Consequences

Sometimes we interpret or justify the solving of inflation as that inflation is being resolved in the same or similar manner throughout the developed world having a developed market economy and that in the method of economic operations we do not differ from others. This is true to a certain extent. However, this is also to the same extent the reason why we are not more effective in removing inflation than others with those and similar measures and policy elsewhere in the world. Nonetheless--also in respect to inflation--essential differences exist and operate in our country in the socialist self-managing socioeconomic relations and in the political system, both as regards its effect and the removal of its causes and consequences.

In connection with these and similar assessments and deliberations about the topical questions of the current economic situation and about the problems which we meet in practice it is necessary first to stress that the Yugoslav economy is no way in a critical position. On the

contrary, I am convinced that Yugoslavia's development, measured by the criteria with which the world assesses the economic strength and prospects of the individual states, is quite good. According to general indicators, we can establish that our social product is growing relatively rapidly, personal incomes are increasing as are real personal incomes and employment. A favorable economic situation exists and that gives prospects and impetus [for further development]. However, there are two "blemishes," if I may call them that, which are not only ours, but--except for four or five of the most developed states--the whole world is fighting them. As regards the assessment of our position and the removal of these defects, there are, naturally, vital differences between other states and our country. The first defect is a deficit in the foreign trade balance of payments and an increase in our debts to the Western capitalist countries in particular. The second defect is the problem of liquidity and illiquidity and debts in the economy, more concretely, the dependence of the economic organizations on credits and banks. However, as regards the latter, the defense mechanisms of our self-managing system operate in this connection rather more excessively than insufficiently, particularly as regards real personal incomes. Despite all the difficulties, in comparison with other countries, Yugoslavia is considered a stable state and, from this viewpoint it really is stable. This by itself proves and shows that the self-managing socioeconomic relations and our political system contain all social possibilities and conditions for solving the problems of inflation and its causes and consequences.

It is precisely in this that vital differences exist between Yugoslavia and the position of other states. For this reason it is not enough to have only the generally valid rules and methods which have been known and used thus far because they do not give us sufficient bases for following and analyzing the execution of our concrete policy and they do not prepare us for resolving the problems at their roots instead of only repeating them. These criteria and methods enable us even less to follow, analyze and assess the behavior of the fundamental proponents of our development and the responsibility for it, and even less enable the fundamental proponents of our development to assess the decisions, mutual operations and final economic and social results and consequences and to make suitable decisions and take suitable steps.

Assessing Development Results by Our Own Criteria

For this reason I believe that we should change, or rather perfect the system of approach to the analyses of the economic situation and development and in particular we should remove all remnants of Keynesian methods and views. In this connection, the fact that the domestic political situation in Yugoslavia is stable and that it is increasingly more consolidated and developed and that it is becoming more and more effective system for coordinating different interests and for insuring coordinated actions with social accords and self-managing agreements can

serve us as a reliable support. Our self-managing system, with all its initial difficulties, demonstrates that it enables our society to find solutions for problems and contradictions of development and to realize its basic directions and social tasks. However, we cannot be satisfied with this. Inflation and the pragmatic solution of its consequences and the manipulation of its level is--in other systems--a means for postponing the solution of the basic contradictions of their social development and the social conflicts and settling of accounts of the opposing social forces and their interests. In our social development, however, inflation is an obstacle to solving the contradictions and for coordinating the different interests in our society, while at the same time it expresses a slow mastering and solving of these contradictions with the development of self-management and a resilience of what is old in our social relations and social practice.

We must shape our own criteria for assessing the achieved level in our social development and for solving its contradictions. Among these criteria are certainly the following:

--Development of self-management and the strengthening of the confidence of workers in the basic organizations and working communities that we are capable of solving--on self-managing socioeconomic foundations and with methods suitable to them--all questions of the social development of today's world more effectively than in other social systems, and that we are also capable of solving those problems which arise in our social development and in the development of self-management;

--Growth of social productivity, not measured with the present simplified statistical criteria, but rather with the criteria of consistency of the development of social and economic activities according to their mutual dependence and with the implementation of the set goals and tasks of the economic policy and social development, set on the foundations of the Marxist theory of social reproduction and with the satisfaction and development of those needs which are included in the social plans as the key, or rather the decisive needs for the further development of the entire society. The criteria of corresponding structural changes are also the basis for assessing the growth of production, the increase in employment and for creating a new value, or rather for earning income, for price trends and for price relations and for all kinds of consumption, including production consumption;

--The development of international economic relations and the realization of tasks of a balancing of the trade balance and the balance of payments with foreign countries along with the fulfillment of the economic and political obligations in accordance with our international policy and with the consolidation of our economic independence, and the conviction of the working people that Yugoslavia's present openness toward the world and its further opening in this direction of all self-managing organizations and communities and the sociopolitical communities

is in every respect of a decisive importance for the international position of socialist self-managing and nonalined Yugoslavia and the condition of its existence, independence and free development.

Problems Must Be Courageously Presented to Workers

The difficulties facing the Yugoslav economy because of international economic relations and the economic trends in the world must not stop the further strengthening of our socioeconomic and political system, for this is the only way to solve the problems and to fulfill the tasks and aims of our economic and social development. We must assess the development achievements using our own criteria, which must be fundamental for us. For our own and for external uses, in international comparisons we may employ the criteria which are used for comparisons and assessments throughout the world. It is only on the basis of our own criteria that workers in associated labor--as the people who are basically responsible for solving the problems which they meet every day--will be able to make assessments and decisions. Nobody in our system can any longer deprive the workers in basic organization of this responsibility. Therefore, all the measures which maintain some kind of patronage over the workers also maintain the wage thinking and behavior which weaken self-management, and, therefore, they cannot yield their expected results.

In our self-managing practice, wage thinking can no longer prevail when income is distributed, or at least it cannot prevail for any length of time. Therefore the patronage over the workers leads to undesirable results or to results of very short duration or even imaginary ones, instead of solving the problems in the only possible way within our society: In such a way that workers are thoroughly informed about the problems and that their tasks and responsibilities concerning their personal incomes and common spending--in harmony with the fluctuations of their productivity and of social productivity--and concerning investment within the limits of actually provided real resources--including their obligations and responsibility for an appropriate working and development of the social services on which their skills and education and the attained social standard of living and general social development depend--are courageously laid before them.

In an organized society like ours, the responsibility of workers is realized primarily through their being organized in their self-managing organs and sociopolitical organizations and through the engagement of all other subjective forces. Therefore this responsibility is primarily the responsibility of the members of the League of Communists, the trade unions, the SAWP and the Socialist Youth Federation, which is to say the basic protagonists of sociopolitical activities at the grassroots level, their basic organizations and other forms of their organized activities in self-managing organizations and communities and their leaderships. I think that--precisely for the sake of these people who

bear responsibility--we must shape such criteria and prepare such analyses of the economic situation that they will be understandable and tangible to them, so that they may serve as a basis for concrete actions in the communities and spheres of labor where they bear responsibility.

To Rely on One's Own Forces and Skills

In my opinion this applies to Yugoslavia as a whole. In this connection, the position of Yugoslavia in the balance of payments and debts abroad is of special importance. This includes our direct links with foreign countries, with other systems and political powers, in which only the relationship of forces and the ability of every country to protect and to insure its interests are of decisive importance. The advantages of our self-managing system, along with the concrete real economic strength of our state, clash here with the power and the interests of business partners in other systems and international relations, with all the political consequences arising from a given real relationship of forces in international economic relations. I am, therefore, convinced that the basic criterion to which all the economic trends should be subordinated and with which we should assess every indicator in every field of social labor separately, is the extent and manner in which it strengthens our economic position in relations with foreign countries and the extent to which it influences the strengthening of our economic independence. This also means the extent to which it helps toward a more satisfactory reliance on one's own forces and skills and a lesser reliance on foreign credits and licenses, with which we maintain to a considerable extent our present level of all kinds of spending ranging from productive consumption to investments and personal, common and public spending. I intentionally stress all kinds of spending, for usually we only speak about common and public spending and lately, with much inconsistency, about personal incomes and investments, but we do not speak about growth and the actual economic significance and the quality of production growth, or the so-called productive consumption. However, the productive consumption, taken as a whole and measured by the funds involved, which run into trillions, is the most important among the factors in social reproduction. Its significance in international economic relations is no smaller, for we join in international economic movements to the largest extent through its course and continuity. It reflects most directly the level of dependence of the unhindered course of social reproduction on the economic relations with foreign countries. It also offers numerous objective criteria for measuring the productivity of our labor by means of the productivity in other economies.

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